


*

UMASS/AMHERST

*



312066 0284 1685 7



Digitized by the Internet Archive
in 2010 with funding from
Boston Library Consortium Member Libraries

THE
LIBRARY
OF THE
MUSEUM
OF
COMPARATIVE ZOOLOGY
AT
HARVARD UNIVERSITY

ELEVENTH REPORT
OF THE
STATE BOARD OF HEALTH
OF
MASSACHUSETTS,
FOR THE
SIX MONTHS ENDING JUNE 30, 1879.



BOSTON :
Rand, Aberg, & Co., Printers to the Commonwealth,
117 FRANKLIN STREET.
1879.

613.07

M38

1879

MEMBERS OF THE BOARD.

HENRY I. BOWDITCH, M.D.	.	.	OF BOSTON, <i>Chairman</i> .
ROBERT T. DAVIS, M.D.	.	.	OF FALL RIVER.
RICHARD FROTHINGHAM	.	.	OF CHARLESTOWN.
DAVID L. WEBSTER	.	.	OF BOSTON.
JOHN C. HOADLEY, C.E.	.	.	OF LAWRENCE.
THOMAS B. NEWHALL.	.	.	OF LYNN.
CHARLES F. FOLSOM, M.D.	.	.	OF BOSTON, <i>Secretary</i> .

CONTENTS.

	Page
1. Noxious and Offensive Trades	5
City of Cambridge v. Niles Bros.	5-11
Bradley Fertilizer Company	11
Summary of Cases	12
2. Prevalent Diseases	13
3. Disinfection (Circular)	19
4. Care of Young Children (Circular)	20
5. House-Drainage (Circular)	25
6. Boards of Health (Circular)	31
7. Registration (Circular)	33
8. Well-Waters, Contamination of	34
9. List of Subjects considered by the Board	35-40
10. Subjects for Future Consideration	40, 41
11. Expenses for the Half-year	42
12. Index of the Eleven Reports (Ten Years)	43

REPORT.

OFFICE OF THE STATE BOARD OF HEALTH,
STATE HOUSE, BOSTON, June 30, 1879.

To the Honorable the Senate and the House of Representatives of Massachusetts.

THE State Board of Health herewith respectfully present their eleventh Report, for the period of six months ending June 30, when the Board was abolished and the new State Board of Health, Lunacy and Charity was created.

THE LAW REGARDING NOXIOUS AND OFFENSIVE TRADES.

In the case of the City of Cambridge *v.* Niles Bros., the evidence was given in detail in the Tenth Annual Report of the Board. The six points of inquiry there stated may be said, in general, to cover two questions: namely, (1) whether the establishment complained of would be a source of offence; (2) whether the water-supply of the city of Cambridge would be contaminated.

As regards the first point, it may be said, that, under the inspection of the Board, the drainage discharging into Alewife Brook, already contaminated by sewage, at first was offensive, but that the mixture of carbolic acid with it has to a considerable extent obviated that difficulty; that the soup can be mixed with the muck so as to avoid foul odors; that the machinery for manipulating the animals, the lard, the offal, etc., has been so carefully arranged, that no complaints of stench have been heard of up to this date; that the hog-pens have been disinfected with dry loam, and that reasonable cleanliness has been observed.

With reference to the contamination of the soil, and thereby the water flowing into Fresh Pond, the rigid care exercised in making the basement and cellar floors of the buildings tight has assured the ground in the immediate vicinity from danger of being rendered impure. The drain-pipe is tight, and well cared for; and the soup may be so disposed of as to secure the

ground-water from any pollution, as may be seen from the results given below of experiments made for Messrs. Niles Bros. by Professor Nichols, as required by the Board.

*Report on the Absorbing of the Soup from the Belmont
Slaughter-House by Means of Muck.*

At your request I have made a number of experiments with reference to the feasibility of disposing of the "soup" from the Belmont slaughter-house by absorbing it in "muck." It is not necessary in this Report to enter into the details of all the various experiments carried on in the laboratory and at the works: the details of some of them are given as an appendix.

The muck examined March 1, as it lay on the ground, contained eighty-two per cent of its weight of water, and readily loses seventy per cent on exposure to rather dry air at ordinary temperature. For the best absorptive effect, however, the muck should not be too dry. When moderately dry, as it would be in summer after several days without rain, the muck will readily absorb from one-fourth to one-third its bulk of soup. The best way, if labor were of no consideration, would be to mix the soup with as little muck as is necessary to hold it, to cover with a thin layer of muck, and to leave exposed to the air for at least ten or fourteen days; then to mix the muck with an additional quantity of soup, and so on. In this way a large amount of soup may be incorporated, and the muck becomes more valuable as a manure. As it becomes rich, it is not absolutely odorless, and worms and maggots appear in it as in any decomposing animal matter: but, if *fresh* soup only be used, the mixing can be carried on without offence; and a very thin layer of unmixed muck thrown over the mixture retains almost all the odor. There is no advantage in mixing *fresh* soup with carbolic acid, and it would be a disadvantage if the muck were afterwards to be used for manure. Practically, on account of the labor involved, it would no doubt be found more advantageous to use a larger quantity of muck, to take less pains with the mixing, and to allow a longer interval between successive doses.

In order to ascertain how much soup is at present pumped on to the hill, I requested the keeping of an accurate record for some time. This was done from May 19 to June 7 (nineteen days in all),—seventeen working days. The total amount pumped during that time was, —

	CUBIC FEET.
Soup	1,900
Liquor from scalding-tub	1,000
Making in all	2,900

i.e., 154 cubic feet per day on the average, or 170 cubic feet for each working day. Allowing, for safety, four times its bulk of muck, this amount of 170 cubic feet would require for its absorption 680 cubic feet, or a pile three feet high and fifteen feet square, or two feet high and eighteen feet square.

In summer, if proper pains be taken, I think the soup may be safely mixed in the piles as they lie. It should be distributed over such an area, that, when it has soaked in and down, there should remain twelve or eighteen inches of muck beneath. This layer of muck will be the most efficient safeguard for the soil beneath. It is true, that, if the saturated muck be treated with a large amount of water, it is possible to leach out from it a quantity of organic matter, ammoniacal salts, etc., forming a liquid which would be valuable for a manure, but which should not be allowed to soak into the ground-water. With material like sample No. 15, a fall of rain of two inches would be absorbed by about eight or ten inches of muck, so that no liquid would drain from it. Of course, in time of continued rain, the soup should be distributed over a somewhat larger area than in dry weather.

In winter, there will be greater difficulty in securing the uniform distribution of the soup, and in preventing its passage into the gravel beneath. Supposing that, as the piles lie now, it were possible to rely in winter upon two feet of available depth of muck, to dispose of the entire discharge for five months (150 cubic feet daily for 150 days, i.e., 22,500 cubic feet), it would be necessary to allow 45,000 square feet; i.e., an acre of surface. This is supposing only one application of the soup. Probably three applications might safely be made during the five months: this would require 15,000 square feet.

If the mixing were made on a cement or other impervious floor, and under cover, so that there would be protection from severe frost, I should think that the entire discharge of five months (22,500 cubic feet) could, without doubt, be absorbed by 19,200 cubic feet (i.e., 150 cords), and possibly by 100 cords, or less. In winter there would be less danger of offence from the mixing, and on an impervious floor less care would be required to avoid over-saturation. It should be noted, that, other things being equal, the thinner the layer or pile of muck, the more soup in proportion will it absorb, because the weight of a thicker pile tends to squeeze out the liquid from the lower portions. It should also be said, that, the smaller the quantity of muck taken to absorb a given quantity of soup, the more handling would be required. Further: it is to be noted, that, as the muck becomes charged with soup, its capacity for absorbing, even at the same degree of dryness, becomes less, on account, no doubt, of the character of the solid matter left, when the water of the soup evaporates away. This solid matter chokes the pores of the muck.

In conclusion, I would say that I believe it is possible to absorb the soup in the muck without danger and without offence, and that this can be done in summer without special difficulty. I am also of the opinion that the process can be carried out in the winter, although with more difficulty. I should not be willing to recommend this method of disposing of the soup during the winter in the manner in which the soup is now applied. I think, however, that the process could be carried on safely, provided (1) that the distribution of the soup was not left to a common laborer, but was in charge of some person, intelligent and thoroughly conscientious; (2) that the soup should be distributed in such a way, and over such an area, that the muck should not be charged at any one time

with more than one-fourth its bulk of soup. This should be ascertained by actual calculation; and if the muck should be frozen, so as not to leave two feet in depth available as calculated above, the soup should be distributed over a larger area.¹ To do this in a satisfactory manner would require the expenditure of more labor than is at present employed.

I append some analytical notes, and accompany the report with samples of muck, and description of the same.

Yours respectfully,

WM. RIPLEY NICHOLS.

MUCK. SAMPLE No. 7.

This is a sample of muck taken from the heap on the hill, and received by me March 1. It is said *not* to have had any soup in contact with it.

It contains, —

	PER CENT.
Water	82.2
“Organic and volatile” matter (including nitrogen 0.5 per cent).	16.5
Mineral matter	1.3
	<hr/> 100.0

In its present condition, it will absorb *three-tenths of its bulk* of water or other liquid.

MUCK. SAMPLE No. 14.

This is a sample of muck that has received a quantity of soup as follows: —

	CUBIC FEET.
Quantity of muck taken, 11 cu. feet	
Soup added April 5	3
Soup added April 19	2.5
Soup added May 17	1.6
	<hr/> 7.1
In all	
or $\frac{6.5}{100}$ of the bulk of the muck.	

The soup first added had been treated with “dead oil;” afterward clear soup was used. The experiment might have been carried further.

In its present condition, this muck will absorb and hold 28 per cent; i.e., nearly one-third of its volume of water.

It contains 69.1 per cent by weight of water.

MUCK. SAMPLE No. 15.

This is a sample of a lot treated as follows: —

	CUBIC FEET.
Quantity of muck taken, 12 cu. feet	
Fresh soup added April 19	4
Fresh soup added May 7	2.7
Fresh soup added May 17	2
	<hr/> 8.7
In all	
or about 75 per cent of the bulk of the muck.	

¹ N.B. — If the soup is distributed by trenches, the distance of the trenches from each other must be calculated with reference to the available depth of muck.

No doubt, at intervals of ten or fourteen days, additional quantities could be added. The sample in its present condition can absorb about 25 per cent of its bulk of water.

It now contains, —

	PER CENT BY WEIGHT.
Water.	76.1
"Organic and volatile" matter (including nitrogen 1 per cent)	14.7
Mineral matter	9.2
	<hr/> 100.0

It will be noticed that this sample contains about the same proportion of water by weight as the original muck. All the added water in the soup has evaporated.

It is true that the muck which was used for this experiment was not identical with that examined March 1: it contained rather more mineral matter and fewer rootlets. It was of about the same degree of moisture.

Soup.

The soup, of course, varies somewhat; but a general idea of its character may be obtained from an examination of a sample received March 12. This sample contained 6 per cent of solid matter. The solid matter left on evaporating the soup contained 15.25 per cent of nitrogen.

Directions.

In the report which I made a few days since of my experiments with the muck, I expressed the opinion that the present method of disposing of the soup might be carried on safely, provided that some modifications were adopted, and that great care were taken.

It may be well for me to indicate the way in which I think the soup should be distributed.

If a simple trench be dug in the heap, and be then filled with soup, the liquid will soak away in all directions; but, if the material is uniform, it will sink rather more rapidly downwards than towards either side. If the trench is dug, as it naturally would be, parallel to the crest of the hill, the soup would be absorbed more rapidly on the lower than on the upper side. It is therefore important that the trenches used at any one time should not be too far apart, and that too much soup should not be put into any one trench, lest the soup should, in some places, soak entirely through the muck, and into the ground beneath.

The distance between the trenches should be about twice as great as the depth of the muck which it is proposed to make use of at the time. Thus, if the pile were three feet deep, I should leave the lowest foot as a safeguard, and calculate to use two feet for absorbing. In this case the distance between the centres of the trenches should be forty-eight inches.

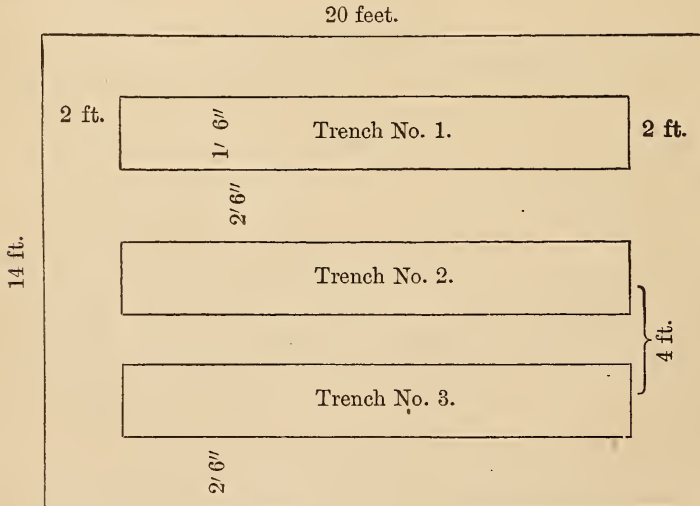
To distribute the soup I should lay out the necessary area (of which I will speak presently), and then dig parallel trenches at the proper distance apart. If the soup is brought, as now, in a pipe, these trenches need not be connected with each other; but it would be possible, if it were more convenient, to have them connected at one end with a single main trench

at right angles to the others. The soup might be allowed to flow into the connecting trench, and directed by temporary dams into the distributing trenches, — first into one, then into the next, and so on.

There should be some arrangement in the tank so that the person running the pumps can see the depth of soup at any time. This could be easily done by means of a float and index. If there are three ditches on the hill, when one-third ($\frac{1}{3}$) of the contents of the tank has been pumped, the pumps should be checked for a moment, so that the person on the hill would notice it, and turn the soup into the second ditch, and so on. As soon as the soup has soaked from the trench, the trench should be filled in with the muck at once.

As to the space necessary: Not considering for the moment the contents of the scalding-tub, which is not emptied every day, the average daily quantity of the *soup* is about 100 cubic feet. It runs up, however, so frequently to 140 cubic feet, that this latter amount should be allowed for. In order to absorb 140 cubic feet of soup, I should allow 560 cubic feet of muck. Supposing that we were using two feet in depth, it would be necessary to have an area of 280 square feet; say, a plot 20 feet by 14 feet. This area might be laid out as shown in the figure.

Of course, on the ground the measurements would not be made accurate to inches.



In this case I should run *one-sixth* ($\frac{1}{6}$) of the amount to be pumped into trench No. 1, then a like amount into No. 2, then into No. 3; and then go back, and run another sixth into No. 1 again, by which time a portion of the soup would have been absorbed. In summer, the trenches might be dug nine inches deep, and eighteen inches wide; and the calculation above is made upon that basis: but in winter they would be of necessity deeper. If they were two feet deep,

each trench would hold one-third ($\frac{1}{3}$) of the amount pumped, and it would not be necessary to go around twice. Other things being equal, the shallower the trenches the better, as the soup is more likely to be evenly distributed, and less likely to soak through the muck into the ground. When the trenches are more than nine inches deep, it will not be necessary to wait for the liquid to be entirely absorbed before the covering is begun; but, as a rule, there should be from six to nine inches of the dry material thrown over the portion which is thoroughly saturated.

It is not necessary that the trenches should be arranged as shown on the previous page; but three short trenches are to be preferred to one long one in securing even distribution.

It would not be difficult to calculate each day how large an area is required, knowing that the tank holds about $3\frac{1}{2}$ cubic feet of soup for each inch in depth. It would be simpler to take the same space every day; and that allowed above will, no doubt, be a safe amount.

The scalding-tub holds 280 cubic feet; and, when this is emptied, it will be necessary to employ for it alone twice the space allowed above for the daily supply of soup. In very rainy or long-continued wet weather, it would be better to allow a space half as large again; but the space allowed above will be sufficient as a rule, taking rain and all into the account.

Of course, the entire area of the heaps will be treated in systematic order; and I should judge that it would be safe to return to the same spot as often as once in four or five weeks in dry weather, and six or eight weeks in wet weather or in winter.

It has been proposed to cover the muck-beds in winter with meadow-hay, or other such substance, in order to lessen the depth to which the frost can penetrate. Any method of securing at least two feet in depth of muck, which can be used as an absorbent, is desirable. This could be accomplished by having the piles made thicker; but, on account of the labor of breaking through the frozen crust, I have no doubt the plan proposed would in the end prove more economical.

Yours respectfully,

WM. RIPLEY NICHOLS.

In the case of complainants *v.* the Bradley Fertilizer Company, the Board have made careful inquiry, and consulted the counsel employed in the case, without being able to ascertain that any of the parties complaining had been troubled since the time of the hearing. Another complaint, however, was sent to the Board from four residents of Hingham, bearing date May 20, 1879, alleging that the place was a public nuisance, which ought to be abated. Since that time, a careful examination of the apparatus employed has convinced the Board that further improvements are practicable in the way of ventilation, and removal of foul gases. Professor Sharples, too,

is making experiments with reference to the possibility of more efficient destruction of the foul odors. Mr. H. P. Judson, in charge of the rendering department of the Brighton Abattoir, has visited the place with the Secretary of the Board; and the parties complained of seem very desirous of at once introducing every possible improvement, as agreed upon by these gentlemen. The petitioners do not at present desire a formal hearing.

During the eight years since the passage of the Act of 1871, the Board have had referred to them fifty-seven petitions under the law regarding noxious and offensive trades. In eight of these, no hearing was asked for, inasmuch as the action of the Board in the test case¹ was unsatisfactory to the petitioners, although it resulted in the removal of the nuisance, without destroying the business of the respondents. Six establishments have been satisfactorily regulated. In two, the parties complained of agreed to adopt the recommendations of the Board without a formal hearing. Thirty-three parties were ordered to cease and desist; and those decisions induced a number of others to give up their offensive methods of slaughtering, many of whom joined the Brighton Abattoir. In seven cases, no hearings were held, on account of some informality, because the questions involved did not come within the jurisdiction of the Board, or because no complainants appeared at the hearing. The petitioners in one case were allowed to withdraw.² These results express, however, far from the whole work of the Board under the law. Many complaints have been adjusted through improvements suggested by the Board; and in that way noxious and offensive trades have been so improved, that the complainants have been satisfied without a formal hearing. At the present time, although two large establishments are under the supervision of the Board, until they can be satisfied what is the proper judgment in each case, the more common result of petitions to abate nuisances is, that local boards act upon

¹ Against Messrs. J. P. Squire & Co. The petitioners, so far as the Board can learn, are now satisfied.

² In one case, the decision of the Board was set aside; but the jury ordered the party to adopt regulations essentially the same as those which were required by the Board (and not carried out) before the judgment to cease and desist was passed.

the advice of the State Board, or that the offensive features of the business alleged to be a nuisance are so far removed as to put an end to complaint.

PREVALENT DISEASES AND CAUSES OF DISEASE.

In continuation of the early practice of the Board, a weekly bulletin of prevalent diseases has been published, but only so far as this State was concerned, until the present year; when a memorandum was adopted, of which a copy is given below, for publication in "The Boston Medical and Surgical Journal," in order that physicians in the State might have fuller information of the approach of diseases dangerous to the public health:—

Reported Mortality for the Week ending June 7, 1879.

CITIES.	Population estimated for July, 1879.	Reported Deaths in each.	Annual Death-Rate per 1,000 during the Week.	PERCENTAGE OF TOTAL DEATHS FROM					
				The Principal "Zymotic" Diseases.	Pneumonia.	Diarrhoeal Diseases.	Diphtheria and Croup.	Scarlet Fever.	
New York	1,085,000	490	23.55	18.37	7.55	3.47	3.06	6.33	
Philadelphia	—	274	—	11.31	3.65	4.74	2.19	3.21	
Brooklyn	564,400	171	15.79	21.06	7.02	5.26	5.85	4.68	
Chicago	—	108	—	14.81	9.26	—	7.41	2.78	
St. Louis	—	132	—	18.18	2.27	12.12	.76	.76	
Baltimore	365,000	125	17.85	19.20	2.80	8.00	4.80	1.60	
Boston	360,000	133	19.26	12.78	6.77	5.26	3.76	.75	
New Orleans	—	88	—	12.50	3.41	10.23	2.27	—	
Cincinnati	—	84	—	26.19	5.95	2.38	3.57	14.28	
District of Columbia,	160,000	85	27.69	27.06	3.53	18.82	2.35	3.53	
Cleveland	—	41	—	9.76	14.63	2.44	—	4.88	
Pittsburg	—	39	—	17.44	10.26	2.56	5.13	5.13	
Buffalo	—	30	—	63.33	3.33	6.67	23.33	13.33	
Milwaukee	—	37	—	18.90	10.81	—	16.21	—	
Providence	101,000	24	12.39	25.00	—	4.17	16.67	—	
New Haven	60,000	16	13.90	12.50	—	—	12.50	—	
Charleston	57,000	39	35.66	10.26	2.56	5.12	—	—	
Nashville	27,000	12	23.17	16.67	—	16.67	—	—	
Lowell	53,300	14	13.69	14.29	—	7.15	7.15	—	
Worcester	52,500	13	12.91	15.38	7.69	—	—	—	
Cambridge	51,400	21	21.29	14.29	4.76	4.76	—	4.76	
Fall River	48,500	10	10.75	20.00	10.00	—	—	20.00	
Lawrence	38,200	13	17.75	23.07	7.69	—	—	7.69	
Lynn	34,000	13	19.94	15.38	—	—	7.69	—	
Springfield	31,500	9	14.90	44.44	—	—	22.22	22.22	
New Bedford	27,000	10	19.31	—	—	—	—	—	
Salem	26,400	10	19.75	10.00	—	—	10.00	—	
Somerville	23,350	5	11.17	20.00	20.00	—	—	—	
Chelsea	20,800	2	5.01	100.00	—	—	50.00	—	
Taunton	20,200	5	12.91	—	20.00	—	—	—	
Holyoke	18,200	8	22.92	12.50	—	—	—	12.50	
Gloucester	17,100	4	12.20	—	25.00	—	—	—	
Newton	17,100	5	15.25	—	20.00	—	—	—	
Haverhill	15,300	10	34.08	50.00	10.00	—	50.00	—	
Newburyport	13,500	4	15.45	—	—	—	—	—	
Fitchburg	12,500	1	4.17	—	100.00	—	—	—	

Two thousand and eighty-five deaths were reported: 332 from the principal "zymotic" diseases, 347 from consumption, 121 from pneumonia, 110 from diarrhoeal diseases, 90 from diphtheria and croup, 83 from scarlet fever, 42 from bronchitis, 28 from typhoid fever, 24 from whooping-cough, 13 from cerebro-spinal meningitis, 11 from malarial fevers, 10 from measles, six from erysipelas, five from remittent fever, four from pleurisy, one from intermittent fever, and one from typho-malarial fever, none from small-pox (five cases are reported from Richford, a small town in the extreme north of Vermont). In the mortality from measles, cerebro-spinal meningitis, diphtheria and croup, whooping-cough, typhoid fever, pneumonia, and bronchitis, there is no noteworthy change. The decrease in scarlet fever and erysipelas continues. There is a slight increase in consumption, moderate from "zymotic" diseases and all causes; while the fatality from diarrhoeal diseases is nearly double that of the previous week. In the nineteen cities of Massachusetts, with an estimated population of 880,850, there is shown a gradual increase in diarrhoeal diseases, a decrease in scarlet fever, and no other noteworthy change.

From *bronchitis*, 18 deaths were reported in New York, six in Brooklyn, four in Philadelphia and Boston, two in Milwaukee, one in Chicago, St. Louis, Baltimore, District of Columbia, Buffalo, Providence, Cambridge, and Salem. From *typhoid fever*, 10 in Philadelphia, four in New York and Chicago, three in Cincinnati, two in Boston and Lawrence, one in Baltimore, Buffalo, and Cambridge. From *whooping-cough*, eight in New York, two in Philadelphia, Brooklyn, and Charleston, one in Chicago, St. Louis, Baltimore, Boston, Cincinnati, District of Columbia, Pittsburgh, Buffalo, Providence, and Chelsea. From *cerebro-spinal meningitis*, two in Baltimore, Buffalo, and Worcester, one in New York, Philadelphia, Cincinnati, Cleveland, Milwaukee, Lynn, and Somerville. From *malarial fevers*, seven in New York, five in Brooklyn, four in St. Louis, one in Baltimore and District of Columbia. From *measles*, six in New York, two in Cleveland, one in Brooklyn and Baltimore. From *erysipelas*, two in Buffalo, one in New York, Brooklyn, St. Louis, and Boston. The death-rate of the colored population in the District of Columbia was more than double that of the whites.

The weather was generally reported cooler and changeable, with light rains; the meteorological record for the week in Boston (latitude $42^{\circ} 41'$, longitude $71^{\circ} 4'$) being as follows: —

DATE.	Barom-eter.	Ther-mometer.			Relative Humidity.				Direction of Wind.			Velocity of Wind.			State of Weath'r.			Rainfall.	
	Mean.	Mean.	Maximum.	Minimum.	7 A.M.	2 P.M.	9 P.M.	Mean.	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.	7 A.M.	2 P.M.	9 P.M.	Duration.	Amount in Inches.
June 1.	29.913	83	96	67	77	35	59	57	SW	SW	SW	10	16	12	C	F	C	—	—
" 2.	29.916	70	91	55	72	55	88	72	W	W	NE	6	12	14	F	O	R	—	.03
" 3.	30.078	50	55	49	100	100	100	100	E	NE	NE	15	14	9	R	R	R	—	.50
" 4.	29.895	60	66	50	100	97	91	96	O	S	SW	0	7	4	R	R	F	—	.88
" 5.	29.833	68	78	56	77	53	77	69	SW	SW	SW	6	12	1	F	O	F	—	.48
" 6.	29.764	63	77	53	72	74	55	67	O	O	W	0	0	20	O	F	F	—	.35
" 7.	30.014	54	62	45	63	28	56	49	NW	NW	W	15	17	4	C	F	F	—	.05
Week.	29.916	64	96	45				73	SW			1,629 miles						45	2.3

¹ O, cloudy; C, clear; F, fair; G, fog; H, hazy; S, smoky; R, rain; T, threatening.

For the week ending May 17, in 144 German cities and towns, with an estimated population of 7,315,369, the death-rate was 28.4, an increase of 0.1 over the previous week, indicating a decrease in consumption, diphtheria and croup, and typhus fever, an increase in scarlet fever, measles, and typhoid fever, while the other prominent diseases remained about the same. Three thousand nine hundred and ninety-three deaths were reported: 590 from consumption, 507 from acute diseases of the respiratory organs, 211 from diarrhœal diseases, 102 from diphtheria and croup, 62 from typhoid fever, 61 from scarlet fever, 56 from whooping-cough, 45 from measles, 21 from puerperal fever, seven from typhus fever, two from small-pox (Berlin and Augsburg). The death-rates ranged from 14.7 in Mannheim to 45.4 in Augsburg; Königsberg, 32.2; Dantzic, 21.2; Breslau, 30.6; Munich, 40.5; Dresden, 27.8; Cassel, 20.2; Berlin, 24.4; Leipsic, 24.6; Hamburg, 31.3; Hanover, 27.8; Bremen, 30.4; Cologne, 24.6; Frankfort-on-the-Main, 23.9; Darmstadt, 19.7. Also for the same week: Vienna, 33.6; Prague, 44.4; Paris, 27.7; Odessa, 30.7.

For the week ending May 24, in the twenty English cities and towns having an estimated population of 7,383,999, the death-rate was 21.4, — a decrease of 1 from the previous week, — with a decline in the mortality from respiratory diseases, diphtheria, scarlet fever, and fever; a very slight increase in measles and whooping-cough, considerable in diarrhœa, and nearly trebled in small-pox (London). Three thousand and twenty-nine deaths were reported: 327 from diseases of the respiratory organs, 109 from whooping-cough, 79 from scarlet fever, 75 from measles, 38 from fever, 35 from diarrhœa, 17 from small-pox, 12 from diphtheria. The death-rates ranged from 16.3 in Brighton to 25.1 in Norwich, 21.6 in London, 17.4 in Bristol, 23.1 in Birmingham, 23.8 in Liverpool, 24.1 in Manchester, 18.6 in Leeds. In Edinburgh the rate was 24; in Glasgow, 21; in Dublin, 35 (small-pox declining).

The sanitary condition of Astrachan and vicinity is reported to be good: typhus fever has become less prevalent. There is a slight increase

in small-pox in the large cities of Europe where it prevails, and a decrease in Poland.

The circulars with reference to prevalence of diseases in the State were sent this year for a quarterly period, instead of annually as heretofore, and to the boards of health, with the request that they would consult, in making their replies, the physicians employed by them, or the medical correspondents of the Board. Two hundred and twenty-three replies were received, or from about two-thirds of the cities and towns in the State. In this way a great deal of valuable information was received, although not of a kind which can be tabulated to advantage, or reported upon a standard constant enough to admit of comparisons between towns or even counties. It may be said in a general way, that pneumonia, rheumatism, neuralgia, and especially influenza, were unusually prevalent throughout the State. It seems desirable, in the future, to even further simplify the system of tabulation and reporting of diseases. The circular sent out for the first quarter of the year was as follows:—

OFFICE OF THE STATE BOARD OF HEALTH,
STATE HOUSE, BOSTON, March 25, 1879.

To the Chairman of the Board of Health.

DEAR SIR, — In order to receive important information with regard to the prevalence of disease throughout the Commonwealth, the State Board of Health have prepared the enclosed table, which they hope you will be kind enough to fill out and return at your earliest convenience.

If there is no physician on your board, will you please consult, in preparing your replies, the physician employed by you, and *especially the medical correspondent* of the State Board of Health, Dr. ———?

Please put a cross in the proper column, and opposite the name of each disease, to indicate whether it was absent, slightly prevalent, prevalent, or very prevalent; adding another cross if the particular disease was *also fatal*, and a zero if *not fatal*: for example, —

DISEASE.	No cases known.	Slightly prevalent.	Prevalent.	Very prevalent.	REMARKS.
Measles . . .			× 0		In March.
Scarlet Fever . . .			× ×		For part of January.
Rheumatism . . .		×			Never common here.
Small-Pox . . .	×				One case of Varioloid in February.
Intermittent Fever,					A few cases <i>not originating here</i> .

Under the table may be put remarks with regard to these diseases or *others not on the list*, suggestions as to *causes of disease*, subjects which you desire the State Board of Health to investigate, etc.

In behalf of the State Board of Health,

Very respectfully yours,

CHAS. F. FOLSOM, M.D., *Secretary*.

Prevalent Diseases, First Quarter, 1879.

Reply from the Board of Health of the city or town of _____

Physicians consulted, _____

DISEASE.	No cases known.	Slightly prevalent.	Prevalent.	Very prevalent.	REMARKS.
Small-Pox . . .					
Measles . . .					
Scarlet Fever . . .					
Cerebro-Spinal Meningitis . . .					
Diphtheria and Croup . . .					
Whooping-Cough . . .					
Erysipelas . . .					
Typhoid Fever . . .					
Diarrhoeal Diseases, Rheumatism . . .					
Neuralgia . . .					
Influenza . . .					
Intermittent Fever, Acute Lung-Diseases . . .					
Chronic Lung-Diseases ¹ . . .					

¹ Under this head, please note their *prevalence as causes of death*.

In the second quarter the following form seemed more desirable:—

DISEASE.	No case known.	Prevalent.	REMARKS.
Measles . . .		× 0	
Scarlet Fever . . .		× ×	
Rheumatism . . .			
Small-Pox . . .	×		
Intermittent Fever . . .			

Prevalent Diseases, Second Quarter, 1879.

Reply from the Board of Health of the city or town of _____

Physicians consulted, _____

DISEASE.	No case known.	Prevalent.	REMARKS.
Small-Pox Measles Scarlet Fever Cerebro-Spinal Meningitis Diphtheria and Croup Whooping-Cough Erysipelas Typhoid Fever Diarrhoeal Diseases Rheumatism Neuralgia Influenza Intermittent Fever Acute Lung-Diseases			

It is especially in this connection that the assistance of the medical correspondents of the Board has been of very great value. Before local boards of health were established, even in our largest cities, they acted as reporters in matters relating to the public health. Their services were given cheerfully, and without pay. They have contributed largely to whatever success has attended the work of the Board, and deserve the gratitude of all those who have been interested in the development of the science of preventing disease. Their replies to the circulars of the Board from year to year embrace discussions with regard to a large range of subjects relative to sanitary laws, and a collection of facts, preserved for future use in thirty large volumes, which are of special value.

The distribution of circulars on matters relating to the prevention of disease has continued. Since the publication of the last Report, three more, as follows, have been added to the list. It is a cause of congratulation to the Board that these circulars have been somewhat widely reprinted outside of our own State.

DISINFECTION.

A CIRCULAR FROM THE STATE BOARD OF HEALTH.

Recent experiments made under the direction of the International Cholera Commission have shown that the ordinary methods of disinfection are inefficient, and, in practice, they have often failed to arrest the spread of infectious diseases.

As it is impossible to experiment directly upon the *unknown* low organisms, which are thought to be the means of transporting the various infectious diseases, the effects of chlorine and sulphurous acid were studied upon *known* living organisms; the probabilities being thought to be in favor of the theory that complete disinfection should destroy at least all known forms of life, although it may be true that the tenacity of life of the infective matter of various diseases differs, just as the degree of cold necessary to put a stop to yellow fever is much less than that required to arrest the spread of cholera.

Chlorine and sulphur fumes, in sufficient quantity, were found to be efficient in killing insects, fungi, bacteria, and infusoria; the objections to chlorine in houses being that it is more costly, that its use is more difficult, and that it destroys metals, textile fabrics, and colors.

The burning of ten grams of sulphur for each cubic meter of air-space, tightly closed, was found *not* to kill bacteria, infusoria, or all insects. Twenty grams, however, were proved to be sufficient for that purpose. One volume of water, when saturated at 59° F., absorbs thirty-seven volumes of sulphurous acid, — enough to kill all the low organisms found in putrid urine.

The following articles were found uninjured after several hours' exposure to an atmosphere in which twenty grams of sulphur had been burned to every cubic meter of air-space: A clock of steel and brass; rusty and clean nails; gold and silver money; a military epaulet; various colored silk articles; a colored rug; calico; down-pillows; a gilt-framed looking-glass; books; water in an uncorked bottle; flour; meat; salt; bread; apples; cinnamon; vanilla; cigars; wall-paper; oil-paintings; varnished articles; gas-fixtures; water-fixtures. A highly polished razor had a slightly cloudy appearance on its upper side, but that was easily rubbed off. The flour and meat were cooked and eaten, and the cigars were smoked, without any abnormal taste or smell being observed; in the bread not all of the observers noticed a slightly acid taste; the inside portion of the apples was unchanged, the skin was slightly sour; the water, after standing, had an acid reaction, but no decided taste or smell. Litmus-paper placed between the leaves of books and under the carpet was turned bright red. Many of the articles exposed had a decided smell of sulphur at first, but that soon disappeared.

The experiments seemed to show that clothing, bedding, and other articles may be disinfected without being changed chemically or injured; and it should be added, that practically this method has apparently accomplished perfect disinfection, as tested in Berlin.

If we may judge from these results, effective disinfection, by burning

sulphur, requires eighteen ounces to each space of one thousand cubic feet. The sulphur should be broken in small pieces, burned over a vessel of water or sand, so as to avoid danger from fire; and, if the room is large, it should be put in separate vessels in different places. The room should be tightly closed for six hours, and then aired: it is better that the room should be warm than cold. Of course, efficiently disinfected air is, during the process of disinfection, irrespirable. Most articles may be disinfected in this way, if hung up loosely in the fumigated chamber, although it would be an additional safeguard to expose any thing thick, like a bed-mattress, to prolonged heat at a temperature of about 240° F.; and, indeed, heat must, with our present knowledge, be considered the best disinfectant. With this end in view, local boards of health are advised to procure furnaces and laundries, as is commonly done in other countries, to be used for the sole purpose of disinfecting articles which have been exposed to the infectious diseases, as recommended in the Ninth Annual Report of the State Board of Health, and described by Dr. A. H. JOHNSON, in an exhaustive paper on Scarlet Fever (pp. 255 *et seq.*), in that report. Of course, a much simpler disinfecting furnace than that described will answer every purpose. For ordinary use, in disinfecting *houses*, the sulphur process is the best.

A solution of chloride of zinc (one part of Burnett's disinfecting fluid to two hundred of water) very quickly kills bacteria *which have been placed in it*, and arrests putrefaction. Caustic lime serves equally as well (1 to 100), but leaves a sediment not always easy to remove. Carbolic acid in sufficient strength to be effective (1 to 100) is more expensive, and of disagreeable odor.

It is needless to add that "disinfectants" used in sufficient quantities to destroy bad smells do not necessarily kill microscopic living organisms; and it is not supposed that they directly influence the so-called "germs" of the infectious diseases, unless concentrated to the extent which has been mentioned.

Finally, fresh, pure air acts as one of the best "disinfectants" by enormously diluting the infectious matter, and, under certain conditions, including time, must render it inert to all effect, even if not quickly destroying it, as many think is the case.

STATE HOUSE, BOSTON, April, 1879.

A CIRCULAR TO LOCAL BOARDS OF HEALTH.

THE CARE OF YOUNG CHILDREN.

The diseases of children which cause the greatest mortality occur mainly during the hot months, or immediately thereafter, and are due largely to overcrowding of population, in cities and in thickly populated parts of towns. They are much aggravated, if not directly caused, by filth of all kinds, especially by filth putrefying under the influence of summer heat.

Therefore infants and children should be taken, so far as it is possible,

during the summer, to places where the air is clean and cool: if not to live in the country or at the seashore, then to parks, open squares, beaches, etc., for a day, or for as many hours at a time, and as often as may be. All sources of impure air in and about the dwelling should be avoided; the drainage should be carefully looked after; the water-supply should be pure; no sink-spouts should pour filthy water on the soil; there should be no untrapped sinks or drains, no stinking privy or pig-sty, no ill-arranged water-closet,¹ no arsenical wall-papers, etc., to poison the air. Soiled clothing, diapers, etc., should be promptly removed from the rooms.

A baby should not sleep in the same bed with another person, and should have plenty of fresh air day and night.

Food.

Improper food is directly or indirectly connected with at least one-half of the deaths of young children. Of all the deaths under one year in Massachusetts, more than one-quarter are from diseases of the digestive apparatus, mainly of diarrhoeal character. Errors in diet cause also a vast number of deaths which do not show their real nature in the mortuary records;—for instance, very many cases of “teething,” “convulsions,” “marasmus,” “atrophy,” “wasting,” “hydrocephalus,” etc., come under that head; and, furthermore, many cases of disease of the lungs, otherwise trivial, become dangerous because occurring in children previously weakened by indigestion.

The new-born child should, if possible, live altogether on the milk of its mother, or, failing that, of a *perfectly healthy* wet-nurse, unless, indeed, when the mother has not quite enough milk, the physician thinks best to supplement it with bottle-food. If neither the milk of the mother nor of a wet-nurse can be had, the milk of the cow or some other animal may be used instead; and this should be supplied fresh night and morning, — not necessarily from one cow.

Milk warm from the cow can usually be taken undiluted by infants of any age; if it has time to cool, it should be thoroughly chilled immediately after milking, before being used for feeding infants.

Whether the baby be nursed or bottle-fed, the meals should be given at regular intervals during the day, every two, three, or four hours, according to the age and vigor of the child; during the night, only once or twice, for one or two months; after that, once or not at all.

The infant should not be allowed to go to sleep during its meals, but should be made to nurse continuously, except for occasional rests of a few seconds, until it has taken all it wants. By this means it soon learns to take just the quantity it needs; and, being neither hungry nor over-filled, it sleeps or lies comfortably between meals.

Crying should not always be considered a sign of hunger, and nursing out of meal-times should never be used to quiet the child.

Both breasts should be used at each nursing; and, when the milk has any tendency to be scanty, each breast should be given twice at each meal.

¹ See circulars on House-Drainage, and on Soil-Pipes and Drains.

It is not always easy to tell whether a child gets as much milk as it ought. Not infrequently when the mother or nurse is losing her milk, and the child is obviously failing, it will yet seem to be satisfied at each meal, probably because it has learned not to expect more, and has ceased to hope for it. Then it suffers for want of sufficient food, and should, of course, be fed from other sources. Drawing on an empty breast, too, is in itself injurious to the child.

It may be said in general, that the food which suits the mother will make good milk. It would be better to abandon most of the current *popular* theories as to what is or is not suitable for nursing-women. Perhaps the most objectionable one is that milk is indefinitely increased by taking large quantities of fluid. Certainly enough extra fluid must be taken to supply the extra amount demanded by the breast. Such vegetables and fruits as give the mother indigestion, or such as are found by experience, from some individual idiosyncrasy, to disturb the child without disturbing the mother, should be avoided; but, as a rule, the mother should eat what she usually finds conducive to her health.

It should generally be left to a physician to decide whether or not a mother is able to nurse her child. Mothers often think their child is not thriving on breast-milk, when the real difficulty arises from faulty habits of nursing, irregularity of meals, etc.

Cow's milk is usually, on the whole, the best material for supplying the place of the natural food. The constituents of cow's milk and of human milk are mainly water, casein, fat, and sugar, although not in the same *proportions*; but that is not the most important difference between the two milks, as may be seen when they are curdled. The curds of human milk are soft and flocculent; those of cow's milk tough and leathery, with a tendency to contract and become more and more hard.

Pure cow's milk is not often well digested by infants under six months old, nor always by older ones. The hard curds that it forms are often vomited, or pass through the bowels, and appear in the discharges. It therefore becomes necessary to dilute it with water or some other material. When water is used, it is commonly found best to give from one-third to one-half milk and from two-thirds to one-half water for the first month or six weeks, and then gradually to diminish the amount of water until at the age of six or eight months the milk is given without water. If the milk has been watered before it is bought, as sometimes happens, it may be given in larger proportion. These rules for diluting milk may only serve as a general guide; for all children have not the same powers of digestion, and some milks contain much more water than others. The greatest care should be taken that the water for diluting milk be not contaminated. If there be any suspicion of its impurity, it is well to boil it, as some physicians recommend in all cases. As human milk contains a larger proportion of cream than cow's milk, it is usual to let the milk stand a while, and take the upper part of it, after the cream has begun to rise. For a similar reason, sugar often is added to the diluted milk; usually ordinary cane-sugar, but sometimes by preference sugar of milk, on the theory, that, resembling the natural sugar of the human milk, it will be less likely to cause indigestion.

If large curds are vomited or passed by the bowels, an alkali should be added to the milk (from two to five grains of bi-carbonate of soda or bi-carbonate of potassa, or from one teaspoonful to a tablespoonful of lime-water, in each bottle of food¹).

The test of a method of feeding is the health of the child; and when, as often happens, children do not thrive well on milk simply diluted, there are several ways of preparing it that will usually make it more digestible. The principle is essentially the same in all; namely, to thicken the milk, and thus prevent the lumping of the curds. Barley, oatmeal, Graham-meal, flour, arrow-root, corn-starch, rice, gelatin, isinglass, and gum-arabic are all used in this way, and then all answer about the same purpose. They contain, it is true, some more, some less nourishment, but much less than the milk with which they are combined; so that their effect, when thus used, may be regarded as chiefly mechanical. The starchy parts of them are not absorbed by young infants, except to a very slight extent.

One of the best home-made preparations is of oatmeal. One tablespoonful of coarse oatmeal is left to soak over night in a quart of water. In the morning it is boiled down to a pint, and strained while hot. When cool, it is of the consistence of jelly, and should be mixed with milk, generally in equal parts, only when about to be used. Pearl-barley may be treated in the same way, and is preferable, if the bowels are relaxed.

There are many manufactured articles in the market, some of which are valuable and may be advantageously employed under medical advice.

Condensed milk sold in open cans is milk simply deprived of some of its water, and has the advantage over undiluted milk that it is less likely to sour in the thick state in which it is kept until ready for use. The taste of it is somewhat changed by the process of condensation, so that the flavor resembles that of boiled milk; but this does not seem to make it less easily digested or less nutritious. It should be diluted with rather less than four times its volume of water, to make it equal to ordinary milk. It cannot be kept in warm weather more than three or four days.

The milk sold in sealed cans is condensed when fresh, and seems to retain the qualities of fresh milk for a very long period, unless it is diluted; so that, in spite of containing a great amount of sugar, the best preparations of it are sometimes useful.

Artificial food, when given, should be about blood-warm.

Babies brought up by hand may take their food from a spoon, a cup, the so-called china duck, or from a nursing-bottle. The bottle has the advantage that the food is obtained by the natural process of sucking: the flow of the food is uniform, and not too rapid. The spoon, cup, etc., have the advantage that they are more easily cleaned, and are decidedly preferable, if the nurse or mother will not use great care.

The bottle should be of the simplest possible arrangement. The best

¹ To make lime-water, put a piece of unslaked lime, as large as a hen's egg, in an earthen vessel, and pour on it slowly a gallon of pure cold water. After a few hours, skim it, and pour off the clear fluid, which should be tightly corked in bottles.

consists of a nipple of soft black rubber, with holes small enough to prevent a too rapid flow, snapped over the lip of a plain bottle with a tapering neck. It should contain eight ounces for young children, and ten or twelve for older ones.

The bottle and nipple should be rinsed out in cold water, and then left entirely immersed in water until wanted for use again. If this is faithfully done, no other washing is required. But, if the milk dries upon the glass or the rubber, it sometimes cannot be removed except with carbonate of soda, scalding, and scrubbing. When thoroughness cannot be assured, it is well to use a weak solution of carbonate of soda for rinsing regularly.

Tubes and joints are objectionable, unless *extraordinary care* can be assured in keeping them clean. They should be put in a weak solution of common cooking-soda, and be rinsed thoroughly before use.

Weaning.

The infant should be weaned in one of the cool months, not between May and October : it should be about one year old, not younger than nine, nor older than fifteen months. It is very injurious for both mother and child to continue the nursing too long.

Long before the time of weaning, the infant should have become accustomed to other food, in addition to the breast-milk : it should have learned to drink milk, or one of the preparations already mentioned, for one meal. At seven or eight months, this may be varied by the addition of softened bread, and by giving simple meat-soup or beef-tea. It is not particularly desirable to give to healthy children meals of concentrated soups or expressed beef-juice; the true aim being, not to crowd the child with nourishment, of which it can easily get enough, but to encourage a vigorous and natural digestion.

As the time for weaning approaches, the number of food-meals may be increased so that the child will be induced to give up the breast with very little difficulty.

Only simple food should be given, and at regular times, avoiding pies, cakes, unripe or over-ripe fruits, soothing-sirups, patent medicines, etc.

Bathing and Clothing.

The infant should be washed thoroughly all over every day once, and during very hot weather twice.

For a few weeks the water should be at about blood-heat or a little below it, from 98° Fahrenheit down to 95° Fahrenheit; and, later, it should be lowered so, that, at an age varying with the health and vigor of the child, the water should be warmed only enough to take off the chill.

It is better to put a baby into a bath of water than to bathe it in the lap; and the water should, if possible, be deep enough to cover it up to the neck.

When no bath-tub is to be had, the best thing to use is the ordinary tin wash-boiler.

The best way to avoid a chill after the bath is to wrap the child at once in a warm cotton sheet or towel, placed on a warm blanket.

The best clothing is that which is warm, and at the same time light. Flannel is the best material for all seasons of the year. Especially in the cool weather following the heat of August, infants are very susceptible to the influence of cold, and at that time they should be looked after with particular care. It is better that the bands of pinning blankets and skirts should be of flannel rather than cotton. Loose blankets and shawls that easily change their position on the body, or get forgotten occasionally, are undesirable garments. The shoulders, arms, and legs should be covered in cool weather, especially during the first four months; the stomach and bowels should always be carefully protected from cold.

Quite as much attention should be paid to keeping the child cool in summer as to keeping it warm in winter. Overheating is a common source of sickness.

OFFICE OF THE STATE BOARD OF HEALTH,
STATE HOUSE, BOSTON, June, 1879.

NOTE. — Copies of this circular may be had upon application to the Secretary of the State Board of Health.

NOTE.

Ridge's food, imperial gralum, prepared groats, and prepared barley are manufactured articles; and the exact peculiarities of them are not known, except that they are found to suit the digestion of many babies. As a rule, they should be given in such proportion, that the food, when ready for use, will pass easily through the nursing-bottle.

Two preparations, Nestlé's and Gerber's lacteous farina, are exceptions to the above rule, and are real foods; that is, they really contain milk, but in a dried and powdered form. With the milk is supposed to be combined a powder of bread-crust, which is rich in dextrin, a soluble substance resembling starch. Unfortunately, these preparations, though very valuable forms of food, are quite expensive. It cannot be otherwise than a misfortune, also, that they are made by a secret process.

It is claimed that Horlick's (American) and Mellin's (English) food contain all the constituents of Liebig's soup for babies, except milk.¹ They appear to be identical with each other, and are valuable as additions to milk.

CIRCULAR TO LOCAL BOARDS OF HEALTH.

HOUSE-DRAINAGE.

The first principle in house-drainage is, that there ought never to be any constant bad odor connected with it. If there be such, it is an indication that *there is a defect somewhere*. Occasional offensive smells also

¹ Baron Liebig's soup for babies, made of malt, flour, bicarbonate of potash and milk, is a very valuable food. It requires, however, more than half an hour's cooking every day, and its place seems to be fairly supplied by Mellin's and Horlick's food.

usually reveal imperfect workmanship, incorrect methods, bad ventilation, or some failing in the quality of materials used or in the proper working of some of the various parts.

As the different means of allowing escape of sewer-gas into dwellings frequently exist for a long time without being detected, and as people may become so habituated to the daily presence of bad smells as not to notice them, it is evident that as much of the plumbing and of the soil-pipes as possible should be *readily accessible to frequent inspection*, to allow of the application at once of the proper remedy for each defect. Inside the house the drains should be of iron, with flange or well-tamped lead joints, and not be so laid under the cellar-floor that they cannot be seen.

The danger to a healthy, vigorous person from breathing foul air, so far as the specific diseases are concerned, is much less than is commonly supposed; yet it is a risk of so great an injury that it should, of course, be avoided. If the foul air comes from a general sewer-system, especially when the sewers are so badly constructed as many in our cities, or if from defective drains, allowing filth to accumulate and putrefy, the danger is ordinarily much greater than from filth before decomposition has begun; and the sense of smell, too, does not so constantly furnish a warning of its presence.

For a temporary purpose, and especially to arrest decomposition and destroy bad odors, disinfectants serve a good purpose; but they are simply palliatives at best, because they *cannot be efficiently applied directly to all places* where filth is likely to accumulate; and they should be depended upon only when the radical measures of prompt and effective removal of all filth, with thorough ventilation, cannot be adopted. Chloride of zinc (Burnett's Disinfecting Fluid), one part to four hundred of water, and carbolic acid, one part to a hundred, kill the *known* low organisms (*fungi, bacteria, infusoria*) immersed in them, and in that proportion are probably thorough disinfectants;¹ but, of course, the concentration must be increased according to the amount of filth in the fluid to be disinfected.

Drains should be of such a size (not over six inches in diameter for an ordinary house) and shape (round) as to concentrate the flow of drainage, and prevent deposits; smooth inside, with continuous lines, free from offsets or jogs at the joints, of suitable inclination (one foot slope in twenty-four will usually be the least that is safe, unless a flush-tank is used), and properly connected with the soil-pipes at one end and the sewer at the other, strong, and of durable material (glazed earthenware or iron). They should be used for all *liquid* refuse, but never for garbage or ashes; and no filth or dirty water should be thrown out in back yards, except to be taken up at once by vegetation; and it should never be allowed to run in gutters in the streets. The common defects in drains cannot all be mentioned here, but are fully discussed in articles by E. S. Philbrick, C.E., and E. C. Clarke, C.E., in the seventh and tenth Reports² of the Board.

¹ Three pounds of green copperas and one pint of carbolic acid to a pail of water may be used as a cheap and useful palliative of filth which cannot be promptly removed.

² These Reports may be found in most of the libraries in the State, or upon application to the board of selectmen.

As a defective house-drain may affect not only the occupants of the house, who may not be owners (and many of whom may not be even tenants), but even a whole neighborhood, every house-drain at least—and better, also, soil-pipes and plumbing—should be constructed and arranged according to approved plans, and be under municipal inspection and control. A plan of the work should always be put on record, both for future use, and because its preparation will insure some forethought and care in its adaptation to the requirements of house and sewer,—and particularly as neither owner nor mechanic can commonly prepare such plans with accuracy and nicety, without calling for advice on some one skilled in that work. It would be well to have two copies of ground-plan and profile,—one to be kept at the house, and the other with the officers in control of the sewer department. The plans should contain *all the works projected*, in connection with the supply of air¹ and water to the house, together with the apparatus for removing the water, after its use, from sinks, water-closets, bath-rooms, etc., through soil-pipes, drains, traps, etc.; and this plan should include *grades* also of all important parts (cellar, drains, catch-basins, yards, sewer).

Drainage of wet sites for houses is also of very great importance, as well as drainage to remove filth; when needed, the same principles are involved, and the same processes applied in its application, as in agricultural drainage. Tile-drains, from two to five inches in diameter, with a fall of not less than one foot in one hundred, are the best for that purpose: they should be laid at least six inches—but better two feet—below the level of the bottom of the cellar. They should never be used to carry away kitchen-slops, or indeed any thing except the water from the soil and subsoil. They should be placed about twenty feet apart in tough soil or clay, and from that distance to forty feet apart in gravel, etc. *Damp cellars are injurious to health*: they often produce consumption, pneumonia, rheumatism, neuralgia, and predispose to diphtheria and other diseases, although strong, vigorous persons frequently do not feel their immediate influence upon themselves, and it is not always felt upon their children. [See a paper by Hon. H. F. French, in the Fourth Annual Report of the Board.]

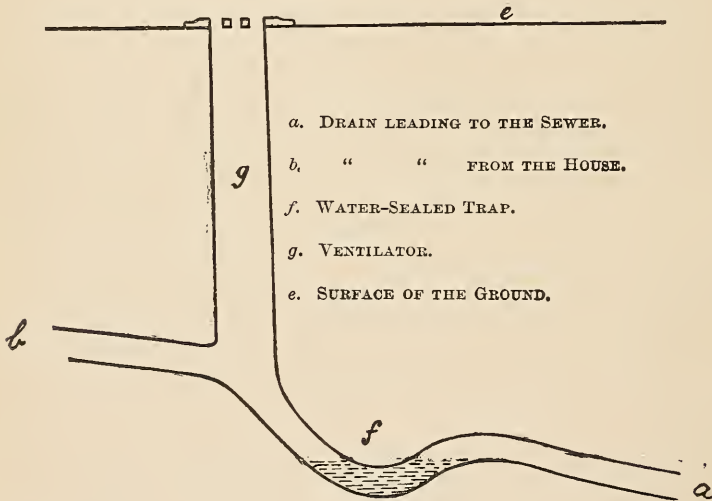
Few sewers are so well constructed as not to require to be isolated from houses by traps. An excellent method of securing this result is shown by the cut, Fig. 1. The ventilator *g* may be made of brick and cement as a manhole, with arrangements for packing, to prevent freezing in winter, and excellent traps are in the market, in one piece, to be used in that case; or it may be continued to the roof by a pipe, which should be used only when there is a trap between it and the sewer. The current of air will usually be found downward, and then upward, and out through the soil-pipe. If extended to the roof, it should not have its upper extremity near a window, or close to a chimney. If used also as a rain-water spout,—a plan which has its advantages for flushing the drains

¹ It occasionally happens that a defect in a drain communicates with the air-supply to a furnace, and so is the means of distributing foul air over the house. Of course the two should never be so near together that such an accident can be possible.

occasionally, — it would be well to have another vent from the drain to allow the escape of compressed air, *provided* the soil-pipe and rain-water spout are ever used for discharging water at the same time.

The best arrangement of the soil-pipe is to carry it up through the roof. In houses already fitted with pan-closets, and not more than two to each soil-pipe, sufficient ventilation may often be got by a pipe at least two inches in diameter, the top of which should not be near and at the level of windows or chimneys. A soil-pipe may be well ventilated, too, by a pipe passing into a *constantly heated* chimney, provided it be so arranged as not to conduct “sewer-gases” into any other part of the house, either by down-draughts through other flues, fire-places, etc., or by insecure joints, and contraction and expansion of the pipe from changes of temperature. If there are several points of discharge into a single soil-pipe, there should be a long vent-pipe similar to that described on p. 453 of the seventh Report of the Board, or a vent into the external air from each, to prevent “siphoning out” of traps.

FIG. 1.



Water-closets, sinks, basins, and bath-tubs should be so securely trapped as to prevent the admission of foul air. Generally speaking, water-closets should be ventilated by direct communication with the external air, and they should never be in sleeping-rooms. A ventilator directly under the seat of the water-closet, and passing with the precautions already given, into a chimney, serves a very good purpose in old houses, when the arrangements cannot be made to fulfil the best requirements, or wherever a constant draught of air can be maintained through the closet-door and out through the ventilator. It is well not to place water-closets in cellars.

Of the various patterns of water-closets in use, the smoothest, the simplest, and those easiest to keep *clean, well trapped, fully ventilated,* and

thoroughly flushed, are the best.¹ Many are now in use which do not fulfil these indications, but there are others in which the faults of the pan-closet and of the old ill-flushed hopper-closet are corrected: whichever are used, the bowls should be often washed with soap and water.

Wash-basins should not be in sleeping-rooms, unless protected by *efficient* traps; and even then it is safer to guard against a possible accident, and have them in an adjoining room.

In view of the fact that many cities have appointed boards of health by virtue of the authority conferred upon them by chap. 133 of the Acts of the General Court of 1877, the Board desire to call their attention to the following important section of that Act: —

“SECTION 5. *Said boards of health, and the board of health of the city of Boston, in addition to the powers conferred upon them by existing statutes, are hereby authorized to prepare and enforce, in their respective cities, such regulations as they may deem necessary for the safety and health of the people, with reference to house-drainage, and its connection with public sewers, where such connection is made.*”

Gross defects in house-drainage may be detected, and minor defects may be commonly found, by dropping a half-ounce of oil of peppermint into the soil-pipe at its opening above the roof, or through the topmost sink or water-closet in the house; a few quarts of water — better hot — should be poured down after it. If *another* person than the one who has used the peppermint visits the various rooms, cellar, closets, etc., there generally will be no difficulty in ascertaining where a leak may be. A better method still, but very costly, is to use hydrostatic pressure, as is the custom in testing gas-pipes. In any case, the opinion of an inspector or person familiar with the matter is desirable.

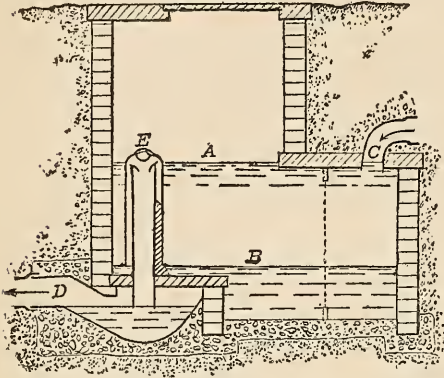
When houses are left vacant for a time, the traps are apt to become dry, — an evil which should be avoided, so far as is possible, by flushing them from time to time, and always a few days before re-occupation of the house; and this flushing of the traps should be supplemented by free ventilation with open windows.

Where water-closets are used, and there are no sewers, the best disposal of the sewage is by the flush-tank and irrigation under the surface of the soil, as described on p. 334 of the seventh, p. 135 of the eighth, and p. 11 of the ninth, annual Report of the Board. (See Fig, 2.²) If cesspools

¹ Directions with reference to these points may be had on application to the sanitary engineers intrusted with the drainage of houses; as it is not the purpose of the Board to enter into details, but to insure proper care and forethought in matters so vital to the health of the community.

² Reprinted, by kind permission of Messrs. Harper & Brothers, from an article in the June number of the “New Monthly Magazine,” by Col. G. E. Waring, jun., who has also drained the town of Lenox on this principle. “A is the surface of the water when the tank is full, and B when it is emptied. The capacity of the tank between the lines A and B is about five barrels. In front of the entrance there is a wire screen to prevent the passage of coarse material. This is held in place by wooden wedges, and may easily be removed for cleansing. The depression below the line B is for the accumulation of solid matters which may not become decomposed. A portion of the tank is carried up to the surface of the ground, with a movable cover for a man-hole. E is Field’s automatic annular siphon, by which the tank is emptied as soon as its

must be used, they should be tight, and often emptied by the odorless process, or else have their contents pumped out on the surface of the ground for fertilizing purposes, where that can be done without causing a nuisance. If the sewage is placed on the soil in the morning of a dry,



clear day, when the sun is shining, and in places where it may be readily absorbed by the earth, the odors from it are the least offensive. In very loose soil, and remote from dwellings, ordinary loose-walled cesspools may be used without danger for a time; but the custom cannot often be entirely approved. An overflow into a stream or upon the land from a tight-walled cesspool often creates a nuisance,

— a difficulty which has been simply and successfully provided for by means of sub-surface irrigation through porous drainage-pipes from the top of the cesspool, laid in the same general way as for use with the flush-tank.

Sewers are of the first importance for removal of sewage, where the water-carriage system is adopted. When for any reason they cannot be introduced, the greatest consideration should be used before it is decided to introduce water-closets, if the result must be to drench the soil with filth and water by means of loose-walled cesspools. The water-carriage system, however, in the opinion of the Board, *if sewers and house-drainage are planned and constructed as they should be*, is by far the most satisfactory, both from a sanitary point of view and as a civilizing agent; and, even where the sewers are very defective, the house-drains may often be so isolated from them by traps and good ventilation as to make the evils of water-carriage less than those of any other system, provided there is an abundant water-supply.

In some cases, where the soil has been polluted so as to endanger the wells, and a public water-supply is not practicable, rain-water may be stored for use; but it should be filtered, and kept free from contamination by dust, dirt, drainage, etc. The water first coming down in rain col-

contents rise high enough to flow over the top of its inner (and longer) limb. The short limb is a dome enclosing the inner limb, with a water-way all around its bottom, reaching to the line B. The drainage flows into the flush-tank, where it is held until the top of the siphon is reached. The whole amount (five barrels) is then discharged with great rapidity into the main sewer (D), washing it clean from end to end. The flow of sewage alone is sufficient to remove all accumulations from the sewer." See also pp. 295-298, 482, 483, and 522, of the *second edition* of Mr. Baldwin Latham's Sanitary Engineering.

lects impure matter from the atmosphere and from the roofs of houses, and this should be thrown away. The rest may be filtered through a brick wall renewed every three months, or by means of animal charcoal, quartz-sand, spongy iron, sponge, cotton-flannel, etc., *frequently cleaned*, although no one of these methods is so good as filtration through clean, well aerated soil. [See "Household Filtration," in an article by Professor W. Ripley Nichols, in the ninth Report of the Board, pp. 205 *et seq.*]

Where the constant system of supply is so universally used as in this country, cisterns for drinking-water are seldom depended upon, except for rain-water. Any overflow-pipe from them should always be kept from discharging directly or through a rain-water spout into a drain or sewer, because such an arrangement would serve as a means of conducting "sewer-gas" into the cistern; and a trap would not be in such case a sufficient protection.

Important as are the proper construction and maintenance of soil-pipes and drains, their thorough usefulness depends also upon a sewerage system adjusted to the wants of each city and town where water-carriage is adopted. Sewers should always be laid according to a definite plan embracing the whole area to be sewered. They should be skilfully built, smooth inside, in straight lines, suitably ventilated, adapted for ready and thorough inspection, of proper size, shape, grade, etc.; they should be tight, and so constructed as not to allow percolation of filth through their walls into the soil and air, although, of course, they may properly be porous enough to drain the soil of superfluous moisture. *The sewage should start from the houses, and go in a continuous current, without allowing any deposits or stopping, until it reaches its destination before putrefaction has begun.* Details with reference to this matter may be found in the eighth Report of the Board, pp. 139 *et seq.*, in an article by E. S. Chesbrough, C.E.

OFFICE OF THE STATE BOARD OF HEALTH,
STATE HOUSE, BOSTON, May, 1879.

NOTE. — Copies of this circular may be had upon application to the Secretary of the State Board of Health.

Of the following two circulars, the first was distributed quite widely in those cities which failed to avail themselves of the privileges of the law authorizing the appointment of boards of health; the second was sent to physicians and boards of health throughout the State.

STATE HOUSE, BOSTON, March, 1879.

DEAR SIR, — The State Board of Health desire to respectfully call your attention to the enclosed act with regard to boards of health, hoping that you will have the kindness to call attention to its very important provisions so far as you may be able to do so. The Board cannot better express their own views of the great value to every com-

munity of an efficient local health department than by quoting as follows from the inaugural address of the Mayor of Somerville:—

“As I took occasion a year ago to express the opinion that the city had made a mistake in voting to accept the health act passed by the General Court in 1877, I desire now to say that the experience of the past year has led me to an entirely different opinion from the one then expressed. The Board of Health has been in successful operation since its organization in the early part of the year; and, beside relieving the city council of a large amount of work, I am satisfied it has accomplished more in the way of abating a large number of nuisances than it would have been possible to accomplish under the old law. It has also commenced a systematic examination of the house-drainage throughout the city, and to enforce wholesome rules and regulations in all cases of contagious diseases. Without attempting to assign the cause, it is a matter of congratulation that during the last three years the death-rate among us has been gradually diminishing. The following is the number of deaths in our city since its organization:—

		Rate per 1,000.
1872	400 . .	24.30
1873	425 . .	21.70
1874	490 . .	22.96
1875	501 . .	22.86
1876	444 . .	20.18
1877	441 . .	19.15
1878	385 . .	16.21

“As the population of the city is larger than at any previous time, it is only reasonable to conclude from the above figures that the great work done in previous years in abating nuisances that had long been the cause of an unenvied notoriety to our city, and the greater care exercised during the past year, have been among the causes that have contributed to this happy result. Somerville now ranks, if not the first, among the first of the cities of the Commonwealth in point of healthfulness. The rate is lower than the lowest given in the Report of the State Board of Health for 1877.”

In behalf of the State Board of Health,

Very respectfully yours,

CHAS. F. FOLSOM, M.D.,

Secretary.

An Act relating to Boards of Health in the Several Cities of the Commonwealth.

Be it enacted, etc., as follows:—

SECTION 1. It shall be the duty of the mayor and aldermen in each of the cities of the Commonwealth, which have not already voted to accept chapter one hundred and thirty-three¹ of the acts of the year eighteen hundred and seventy-seven, to notify and warn the legal voters of said cities to vote upon the acceptance of said act at the then next meeting in said cities respectively, for the election of city officers; *provided* the mayor and aldermen have been requested in writing so to do, thirty days prior to the time of holding said meeting, by fifty voters residing therein.

¹ Authorizing the appointment of boards of health in the cities of the Commonwealth.

SECT. 2. In case of a severe epidemic or of danger to the public health, the mayor and aldermen of any city in the Commonwealth, where there is no board of health, may appoint such a board in accordance with the provisions of chapter one hundred and thirty-three of the acts of the year eighteen hundred and seventy-seven; *provided* they have been requested to do so by one hundred voters in said city.

SECT. 3. This act shall take effect upon its passage.

Approved March 13, 1879.

OFFICE OF THE STATE BOARD OF HEALTH,
STATE HOUSE, BOSTON, June, 1879.

DEAR SIR, — The State Board of Health desire to very respectfully call to your notice the fact that they have been requested this year, for the first time, to edit the registration reports of the State; and they beg to earnestly ask for your co-operation in securing the enforcement of the law with reference to the collection of vital statistics, as the importance of the matter will readily occur to you.

All the necessary blanks and information in detail, including the Statistical Nosology, prepared for the International Congress by Dr. William Farr, will be furnished by the Secretary of the Commonwealth, either directly, upon application to him, or through the town or city clerk or local registrar.

Local boards of health are reminded that they can be of very great assistance in this matter, and that the registration can be made very much more accurate than at present by their means.

Any practising member of any branch of the medical profession, who may have attended a person during his last illness, is bound — if applied to within fifteen days after the decease of such person — *forthwith* to “furnish for registration a *certificate* of the duration of the last sickness, the disease of which the person died, and the date of the decease, as nearly as he can state the same.” *Penalty for non-compliance*, — ten dollars.

No undertaker or sexton or other person is allowed to bury any body, or to remove it from one town to another for burial, without a permit to do so from the town or city clerk or local registrar; and this permit must not be given until the undertaker or person performing the burial or removing the body has obtained from the physician attending, or from the board of health, or from the physician acting for the board of health, a certificate giving the cause of death, as required by statute. Local boards of health can make arrangements to have these certificates of the causes of death approved by themselves.

In order to facilitate the effective operation of the law, it is earnestly recommended that the medical practitioner who has been in attendance at the death, or during the last illness, of any person, shall *place his certificate of the cause of death, immediately¹ after such death, in the hands of some person in attendance, or of some member of the household in which the*

¹ Allowing reasonable time, of course, for cases where there are to be autopsies.

death occurred, for the use of the undertaker or other informant in making return of the death to the town clerk or registrar.

Physicians and local boards of health are respectfully desired to observe the provision in our laws *with regard to births*, and to further in every way in their power the collection of accurate statistics of them. This they can do by themselves sending notice of births; by telling families of their patients what a duty they have to perform; and by showing how important it is that the statistics should be returned *promptly and correctly*.

Parents are required by the law to give notice to the clerk of the births of their children; householders, to give notice of every birth happening in their houses; masters of ships, keepers of workhouses, houses of correction, prisons, hospitals, almshouses, — except the three State almshouses, — to give like notice of every birth happening among the persons under their respective charges, *under penalty of a sum not exceeding five dollars* for neglect to give such notice for the space of six months after each event. Parents and other relatives of children born, and the occupiers of tenements in which any births may take place, are requested to report to the clerk or registrar, *as soon after the event as may be, every case of birth* which may occur, including *all still births*.

In behalf of the State Board of Health,

Very respectfully yours,

CHARLES F. FOLSOM, M.D.,
Secretary.

As a result of facts mentioned in the circular on House-Drainage, the local Board of Health of Edgartown have undertaken an investigation with regard to their water-supply and drainage. The State Board have found it necessary to condemn four of the wells in that town as containing an amount of human excrement rendering them dangerous to the public health; and the local board have enforced their order. It has seemed fair to attribute a considerable amount of illness to the use of water from two of the wells; a third was used for a bakery, and the fourth for many transient boarders: so that it is impossible to say how far they may or may not have distributed the seeds of disease. The investigation is still going on under the direction of the Board; and it may prove necessary to condemn other wells, in order to give full security to the thousands of visitors to the town. The local board have issued stringent regulations to prevent an accumulation of filth, which in former years has been excessive, and a source of stench.

Each year the work of the Board has increased very much in conferring with local boards as to their powers under the

law, and in giving advice with regard to individual complaints, or sources of foul odors and ill health. As more and more towns organize boards of health, there would naturally be more of such work to be done. Indeed, the Board, in the ten years of their existence, have as yet hardly been able to more than prepare the community to see the necessity of concerted action to prevent disease; and, in some form or other, that work must go on.

The establishment of the National Board of Health, their conference with official delegates of the various state boards of health at a meeting called for that purpose in Atlanta, and the successful organization of the Sanitary Council of the Mississippi Valley, composed of the state and municipal boards of health of that valley, for the purpose of preventing the inroad of dangerous diseases, mark a progress in the estimation of the nation of wise measures to prevent disease, and are most encouraging signs for the future.

The correspondence of the Board, and their exchanges of sanitary publications with other boards, in this country and in Europe, have increased very much, so as to place them now in relations with a large part of both countries. Indeed, the library collected, partly in this way, and partly by purchase,—embracing, too, many volumes of letters from sanitarians and others,—is often consulted for the benefit of physicians and boards of health. It has proved of increasing usefulness each successive year.

The following list comprises the subjects upon which special investigations and reports have been made, the results of which were published in the series of reports:—

SLAUGHTER-HOUSES, ETC.

FIRST REPORT.—Slaughtering for the Boston Market. By Dr. George Derby, Secretary.

THIRD REPORT.—Slaughtering, Bone-Boiling, and Fat Melting. By Dr. George Derby, Secretary.

FOURTH REPORT.—Report of the Butchers' Slaughtering and Melting Association. By J. N. Merriam, President.

FIFTH REPORT.—The Brighton Abattoir. Report of the President. Description of the Abattoir. Letter from Mr. J. S. Schultz, describing European Abattoirs in 1873.

SIXTH REPORT. — Our Meat-Supply and Public Health. By Dr. C. F. Folsom, Secretary. The Transportation of Live-Stock. By J. C. Hoadley, Member of the Board. The Brighton Abattoir. By J. N. Merriam, President.

TENTH REPORT. — "The City of Cambridge *v.* Niles Brothers." Report of the Evidence taken before the State Board of Health.

PUBLIC HEALTH, ETC.

FIRST REPORT. — Report on the Sale of Poisons. By the Board. The Prevention of Disease. By Dr. George Derby, Secretary.

SECOND REPORT. — Poisoning by Lead Pipe. By Dr. George Derby, Secretary, and Professor W. R. Nichols. Health of Minors employed in Factories. By Dr. George Derby, Secretary, and Dr. F. W. Draper. Ventilation of Schoolhouses. By A. C. Martin, Architect. Air and Some of its Impurities. By Dr. George Derby, Secretary, and Messrs. A. H. Pearson, H. B. Hill, and C. Stodder. The Use and Abuse of Intoxicating Liquors : Correspondence. Houses for the People. Convalescent Homes and the Sewage Question. By Dr. H. I. Bowditch, Chairman of the Board.

THIRD REPORT. — Arsenic in Certain Green Colors. By Dr. F. W. Draper. The Effects on Health of the Use of Sewing-Machines moved by Foot-Power. By Dr. A. H. Nichols. The Use and Abuse of Intoxicating Liquors : Analysis of the Correspondence. By Dr. H. I. Bowditch, Chairman of the Board. The Use and Abuse of Opium. By Dr. F. E. Oliver. Mill-Dams and Other Water Obstructions : Effect on Health. By Dr. George Derby, Secretary.

FOURTH REPORT. — Infant Mortality. By Dr. E. Jarvis. Some of the Causes or Antecedents of Consumption : Analysis of a Correspondence. By Dr. H. I. Bowditch, Chairman of the Board. The Homes for the Poor in our Cities. By Dr. F. W. Draper. Beer-Shops and Prohibitory Laws. By P. E. Aldrich, Member of the Board.

FIFTH REPORT. — On the Use of Zincd or Galvanized Iron for the Storage or Conveyance of Drinking-Water. By Dr. W. E. Boardman. Hospitals. By Dr. George Derby, Secretary. School Hygiene. By Dr. F. Winsor. The Work of Local Boards of Health. By Dr. A. Ames, jun. Preventive Medicine and the Physician of the Future. By Dr. H. I. Bowditch, Chairman of the Board. Political Economy of Health. By Dr. E. Jarvis. The Health of the Farmers of Massachusetts. By Dr. J. F. A. Adams. Some Farm-Houses, and some Mistaken Ways of living in them. By Mrs. T. F. Plunkett.

SIXTH REPORT. — Cremation and Burial : An Examination of their Relative Advantages. By Dr. J. F. A. Adams. The Value of Health to the State. By Dr. W. E. Boardman. Inebriate Asylums or Hospitals. By Dr. H. I. Bowditch, Chairman of the Board. Ventilation of Railroad-Cars. By Dr. T. W. Fisher : With Chemical Analyses of the Air in Cars. By Professor W. R. Nichols. Composition of the Air of the Ground Atmosphere. By Professor W. R. Nichols.

SEVENTH REPORT. — Registration of Prevalent Diseases. By Dr. F. W. Draper. Sanitary Hints. By Dr. H. I. Bowditch, Chairman of the Board.

EIGHTH REPORT. — The Growth of Children. By Professor H. P. Bowditch. Registration of Deaths and of Diseases. By Dr. C. F. Folsom, Secretary.

NINTH REPORT. — Sanitation of Public Schools in Massachusetts. By Dr. D. F. Lincoln. Dangers from Color-Blindness. By Dr. B. Joy Jeffries. Cottage Hospitals. By Dr. J. F. A. Adams.

TENTH REPORT. — Physical Education in Amherst College. By Professor E. Hitchcock, M.D. The Growth of Children. By Professor H. P. Bowditch. Coal-Gas from Heating-Apparatus. By Dr. F. Winsor. A Contribution to the Study of Ventilation. By Dr. E. Cowles.

DISEASES AND THEIR PREVENTION.

SECOND REPORT. — Health of Towns.

THIRD REPORT. — Health of Towns.

FOURTH REPORT. — Health of Towns.

FIFTH REPORT. — Health of Towns.

SIXTH REPORT. — Health of Towns.

SEVENTH REPORT. — Health of Towns.

EIGHTH REPORT. — Health of Towns.

NINTH REPORT. — Health of Towns.

TENTH REPORT. — Health of Towns, Boards of Health, Water-Supplies, Prevalent Diseases, Circular on Drainage, etc.

SECOND REPORT. — Mortality of Boston in 1870. By Dr. George Derby, Secretary, assisted by Dr. F. W. Draper. Trichiniasis in Massachusetts. By Dr. George Derby, Secretary. Charbon, or Malignant Pustule, in Massachusetts. By Dr. A. H. Nichols. Typhoid Fever in Massachusetts. By Dr. George Derby, Secretary.

THIRD REPORT. — Small-Pox in Massachusetts. By Dr. George Derby, Secretary.

FIFTH REPORT. — Typhoid Fever in Medford in 1873. By Dr. A. H. Nichols. The Epidemic of Cerebro-Spinal Meningitis in Massachusetts in 1873. By Dr. J. B. Upham. Small-Pox in Spencer in 1873. By Dr. F. W. Draper.

SIXTH REPORT. — Report on the Sanitary Condition of the State Prison at Charlestown. By the Board.

SEVENTH REPORT. — Health of Boston in 1875. By Dr. F. E. Oliver. Health of Lowell in 1875. By Dr. F. Nickerson. Report on an Outbreak of Intestinal Disorder, attributable to the Contamination of Drinking-Water by Means of Impure Ice (Rye Beach, N.H.). By Dr. A. H. Nichols.

EIGHTH REPORT. — The Sanitary Condition of Lynn. By Dr. J. G. Pinkham. Diphtheria in Lynn. By Dr. J. G. Pinkham. Diphtheria in Salem. By Dr. A. H. Johnson. Diphtheria in Lowell. By Dr. F. Nickerson.

NINTH REPORT. — Diphtheria in Gloucester. By Dr. C. F. Folsom, Secretary. Diphtheria in Taunton. By Dr. A. S. Deane. Typhoid Fever in Taunton, Raynham, Saugus. By Dr. C. F. Folsom, Secretary.

The Sanitary Condition of Cambridge. By Dr. E. R. Cogswell. Scarlet Fever. By Dr. A. H. Johnson. Vegetable Parasites, and the Diseases caused by their Growth upon Man. By Dr. J. C. White.

FOOD AND DRINK.

SECOND REPORT. — On the Use of Milk from Cows affected with "Foot-and-Mouth Disease." By Dr. A. H. Nichols.

THIRD REPORT. — The Adulterations and Impurities of Food. By Professor H. B. Hill.

FOURTH REPORT. — Character of Substances used for flavoring Articles of Food and Drink. By Dr. H. K. Oliver. The Food of the People of Massachusetts. By Dr. George Derby, Secretary. The Adulteration of Milk. By Dr. A. H. Nichols and Professor J. F. Babcock. The Adulterations and Impurities of Food. By Professor H. B. Hill.

NINTH REPORT. — The Filtration of Potable Water. By Professor W. R. Nichols.

INSANITY, AND PROVISION FOR THE INSANE.

THIRD REPORT. — Proper Provision for the Insane. By Dr. E. Jarvis.

EIGHTH REPORT. — Disease of the Mind. By Dr. C. F. Folsom, Secretary.

TENTH REPORT. — Hospital Homes for the Insane. By Dr. T. S. Clouston.

DRAINAGE, SEWERAGE, POLLUTION OF STREAMS, ETC.

SECOND REPORT. — Pollution of Mystic-Pond Water. By Dr. George Derby, Secretary, and Professor W. R. Nichols.

FOURTH REPORT. — Sewerage; Sewage; the Pollution of Streams; the Water-Supply of Towns. By Dr. George Derby, Secretary, and Professor W. R. Nichols. Drainage for Health. By H. F. French.

FIFTH REPORT. — On the Present Condition of Certain Rivers of Massachusetts, together with Considerations touching the Water-Supply of Towns. By Professor W. R. Nichols.

SEVENTH REPORT. — A Special Report on (1) The Pollution of Rivers; an Examination of the Water-Basins of the Blackstone, Charles, Taunton, Neponset, and Chicopee Rivers, with General Observations on Water-Supplies and Sewerage. By J. P. Kirkwood, C.E. With an Appendix giving Chemical Analyses. By Professor W. R. Nichols. (2) The Water-Supply, Drainage, and Sewerage of the State from the Sanitary Point of View. By Dr. F. Winsor. (3) The Disposal of Sewage. By Dr. C. F. Folsom, Secretary. (4) Summary and Recommendations. By the Board. Surface-Drainage of the Metropolitan District. By C. W. Folsom, C.E. Defects in House-Drainage, and their Remedies. By E. S. Philbrick, C.E.

EIGHTH REPORT. — Sewerage: its Advantages and Disadvantages, Construction and Maintenance. By E. S. Chesbrough, C.E. The Pollution of Streams; Disposal of Sewage, etc. By Dr. C. F. Folsom,

Secretary: With Chemical Examinations. By Professor W. R. Nichols: and a Map of the Nashua-River Basin. By E. K. Clark, C.E.

NINTH REPORT. — Drainage and Health: Sewerage and the Pollution of Streams; including the Draught of a Law. By the Board.

TENTH REPORT. — Common Defects in House-Drains. By E. C. Clarke, C.E.

These matters were treated of, also, at greater or less length by the Board, in their general reports for the several years, where they have also considered the following subjects: —

MODEL LODGING-HOUSES AND TENEMENT-HOUSES.

FIRST REPORT. — Comparison of their Relative Effects upon the Health and Morals of the People.

SECOND REPORT. — Overcrowding of Tenement Houses, and Want of Clean Streets in Boston.

THIRD REPORT. — Model Lodging and Low Tenement Houses.

INTOXICATING LIQUORS.

FIRST REPORT. — Their Use as a Beverage.

TENTH REPORT. — Intemperance.

SLAUGHTER-HOUSES, ETC.

THIRD REPORT. — Law concerning Slaughter-Houses and Noxious and Offensive Trades: Doings of the Board under said Law.

FOURTH REPORT. — The Same

FIFTH REPORT. — The Same.

SIXTH REPORT. — The Same.

SEVENTH REPORT. — The Same.

EIGHTH REPORT. — The Same.

NINTH REPORT. — The Same.

TENTH REPORT. — The Same.

THIRD REPORT. — The Brighton Butchers and the Proposed Abattoir.

FOURTH REPORT. — Butchers' Slaughtering and Melting Association.

FIFTH REPORT. — The Brighton Abattoir.

SIXTH REPORT. — The Brighton Abattoir.

SEVENTH REPORT. — The Abattoir and the Slaughter-Houses in Brighton.

DRAINAGE, SEWERAGE, SEWAGE, ETC.

SECOND REPORT. — Pollution of Streams.

FOURTH REPORT. — Miller's-River Commission; Sewerage of the Metropolitan District.

FIFTH REPORT. — Sewerage of the Metropolitan District; Miller's-River District in Cambridge and Somerville.

SIXTH REPORT. — Drains and Sewers.

EIGHTH REPORT. — Pollution of Streams; Disposal of Sewage, etc.

NINTH REPORT. — Drainage and Sewerage; Sewage of Concord State Prison; Pollution of Streams; Summary of Bill; Pollution of Streams.

TENTH REPORT. — The Disposal of Sewage; Sewerage of the Worcester Lunatic Hospital; Danvers Lunatic Asylum; Concord State Prison, and the Women's Prison at Sherborn.

PUBLIC HEALTH.

FIRST REPORT. — The Condition of "Lock-ups."

SECOND REPORT. — The Foot-and-Mouth Disease in Cattle: its Effects on Man; Small-Pox in Massachusetts; Sewing-Machines: Influence on Health of Female Operatives.

THIRD REPORT. — The Influence of Mill-Ponds on Health; Record of Sickness.

FOURTH REPORT. — A Receiving-Tomb in the Vicinity of Houses; Revision and Codification of Health Laws; Boards of Health; Small-Pox.

FIFTH REPORT. — Undrained Land; Excavations in Clay Lands; Asiatic Cholera; Small-Pox.

SIXTH REPORT. — Charcoal Pits; Registration of Disease; Local Boards of Health; Hydrographical Survey; The Sale and Use of Poisons; Investigation of Alleged Sickness from Low Water in "Little Pond."

EIGHTH REPORT. — Supervision of the Insane.

NINTH REPORT. — Boards of Health; Vital Statistics; Circulars on Hydrophobia, Scarlet Fever, and Diphtheria.

TENTH REPORT. — Yellow Fever in 1878; Poisoning by Arsenic; Boards of Health; Vital Statistics; Supervision of the Insane; Syphilis and Prostitution; The Law appointing Medical Examiners; Regulation of the Practice of Medicine; Impure Ice, not freed from Impurities by Freezing.

Many subjects are still under consideration, upon several of which a considerable amount of work has already been done. Under the new law, the duties of the Health Department will be increased — as was proposed by the Board some time ago — by the sanitary supervision of the public institutions of the State.

The topics which seem to demand the most immediate attention and investigation are, —

A digest of the laws of public health of the State, for the use of local boards of health.

A survey of the river-basins of the State, in continuation of the study of pollution of streams.

An investigation into the question of the relation of privies to wells.

An examination of the Merrimack River and Mystic Pond

as sources of water-supply, and, so far as possible, the sanitary condition of the cities situated upon them.

A concise series of regulations, to be published under the direction of the Board, to be followed out in works of water-supply, house-drainage, sewerage, and disposal of sewage.

The relation of diseases of animals, especially of swine, cows, and horses, to men; the dangers therefrom, and the means of obviating them.

Adulteration of food.

Arsenic.

This list comprises only a small portion of the subjects under consideration, and it is hoped that it will be possible to take up the others in their proper time.

All of which is very respectfully submitted.

HENRY I. BOWDITCH.
ROBERT T. DAVIS.
RICHARD FROTHINGHAM.
DAVID L. WEBSTER.
JOHN C. HOADLEY.
THOMAS B. NEWHALL.
CHARLES F. FOLSOM.

THE expenses of the Board for the half year are as follows:—

Printing and stationery	\$326 90
Postage and stationery	262 70
Travelling expenses	198 22
Carriage and horse hire	51 50
Messenger	45 25
Books and binding	41 80
Express	15 50
Plans for hospital	15 00
Gas-fixtures	4 42
Repairing curtains	1 00
Ink	50
Expert to visit Weymouth	10 00
T. H. Hay, clerk	275 00
	<hr/>
	\$1,247 79

GENERAL INDEX.

VOLUMES I.—XI.

BY

FRANCIS H. BROWN, M.D.,

BOSTON.

GENERAL INDEX.

Abattoirs:—

- Need for their existence I. 31
- In Paris I. 36; V. 171
- Butchers' Hide and Melting Association, New York I. 27
- Brighton butchers and proposed abattoir III. 5, 242
- Slaughtering, bone-boiling, and fat-melting III. 5, 223
- In Brighton V. 20, 153; VI. 15, 19, 185; IX. vii
- Description of abattoir V. 164
- In Europe V. 170
- Abattoir and slaughtering-houses in Brighton VII. 4
- See also* "Bone-boiling, fat-melting, slaughtering."

A B C process:—

- A B C process of treating sewage IV. 47; VII. 331

Accidents:—

- In insane asylums VIII. 390
- British asylums VIII. 393

Adams, Horatio:—

- Poisoning by lead pipe II. 32

Adams, J. F. A.:—

- Health of the farmers of Massachusetts V. 24, 181
- Social condition V. 185
- Prosperity V. 185
- Longevity V. 190
- General health V. 195
- Causes of disease V. 196
- Prevailing diseases V. 200
- The farmer's work V. 202
- Work of the wives and children of farmers V. 209
- The farmer's diet V. 214
- Location of farmhouses V. 223
- Influence of a damp location upon consumption V. 227
- Cleanliness of surroundings V. 231
- Decaying vegetables in cellars V. 236
- Proximity to barnyards V. 237
- Drinking-water V. 238
- Sleeping-apartments V. 240

Adams, J. F. A., Health of the Farmers of Massachusetts — *Continued.*

Mental influences	V. 242
Recapitulation	V. 247
Cremation and burial	VI. 20, 241
History and methods of cremation	VI. 246
Intramural interment	VI. 266
Interment at the present day	VI. 276
Regulations for burial-grounds in England	VI. 277
Fleck's examination of well-water from Dresden cemeteries	VI. 281
Circular	VI. 284
Sickness induced or aggravated by proximity of dwellings to cemeteries	VI. 284
Examination of well-water from vicinity of cemeteries, VI. 292, 295, 297, 298	
Medical opinion of burial and cremation	VI. 301
Conclusion	VI. 309
Bibliography	VI. 315
Cottage hospitals	IX. xxii, 81
Hospitals in Massachusetts outside of Boston	IX. 85
House of Mercy, Pittsfield	IX. 86
Adlum, John:—	
Grape-culture in America	III. 97
Adulteration:—	
Food	III. 7
Adulteration and impurities of food	III. 131; IV. 15, 389
Adulteration and impurities of vinegar	III. 134
Adulteration of coffee	III. 136
Adulteration of milk	IV. 14, 277
Methods of adulteration of milk	IV. 285
Analyses of milk	IV. 293
Confectionery	IV. 390
Pickles	IV. 393
Age:—	
Age distribution of population in Lynn	VIII. 182
At which menstruation usually begins in American women	VIII. 284
Agriculture:—	
Agriculture	V. 355, 360
Air:—	
Impure air and value of fresh air	I. 51
Air and some of its impurities	II. 15, 395
Outer air in Boston	II. 399
Rooms of the Institute of Technology	II. 400
Schoolrooms in Boston	II. 400
Air of halls, etc., in Boston	II. 402
Air in Cambridge	II. 404
Air of a recitation-room, Harvard College	II. 404
Carbonic acid found in the open air in England	II. 405
Charles Stodder on microscopic contents of air in Boston	II. 406

Air—Continued.

Ventilation of schoolhouses	II. 14, 369; V. 434; IX. 231, 235, 248
Air of hospitals	V. 324
Ground atmosphere	VI. 20, 205
Composition of the air	VI. 20, 205
Amount of carbonic acid in ground air in Dresden and Munich,	VI. 209, 210, 212
Boston Back Bay	VI. 213, 217, 218
Examination of air	VI. 213
Air in the soil above decomposing bodies	VI. 221
Rapid diffusion of carbonic acid	VI. 224
Examination of air of railroad-cars	VI. 225, 229
Sewage of one town polluting air or water of another	VII. 228
Air-space per individual in buildings	VI. 237
In railroad-cars	VI. 236
Contaminated air and soil	VIII. 116
Illustrations from poisoned air	VIII. 118
Composition of sewer-gas	VIII. 121
Polluted air a cause of disease	X. 305
Air-supply for furnaces	X. 300
Albany:—	
Albany stock-yards	VI. 127
Albumen:—	
Derived from blood	I. 30, 35
Mode of making	I. 33
Increased price	I. 33
Use by calico-printers	I. 30
Use by sugar-refiners	I. 30
Alcohol:—	
Alcoholic drinks, their use and abuse	II. 11
Circulars	II. 246, 256
Analysis of information derived from correspondence throughout the globe	III. 6, 71
Additional analysis of evidence as to the use and abuse of intoxi- cating liquors	IV. 12, 133
Cosmic view concerning alcoholic drinks	III. 73
Needful medicinally	III. 92
Sometimes food	III. 94
Percentage in various drinks	III. 105
Beer-shops and prohibitory laws	IV. 133
Artificial essences in alcoholic liquors	IV. 166
Use by persons predisposed to consumption	V. 43
Aldrich, P. E.:—	
Beer-shops and prohibitory laws	IV. 12, 133
Evidence of clergymen and others	IV. 137
Algæ:—	
Effect of algæ on water	IX. 157

Allen:—

Allen's buildings in London II. 208

Almonds:—

Essential oil of bitter almonds IV. 146, 148

Almshouse:—

Drainage of Tewksbury Almshouse IV. 185

Alopecia:—

Alopecia areata III. 270

Alumina:—

Alumina process of treating sewage VII. 330

Ames, A., jun.:—

The work of local boards of health V. 26, 449

Organization V. 452

Health regulations V. 453

Board work V. 455

Prevention of disease V. 455

Privies V. 455

House-offal V. 465

Slaughter-houses, melting and rendering factories V. 469

Hogs, goats, etc. V. 470

Diseased animals V. 471

Intramural burying-grounds V. 472

Clothing, occupations V. 473

Tenements, schools, public buildings V. 474

Food and drugs V. 475

Vaccination V. 479

Restriction of disease V. 480

Small-pox V. 481

General sanitary observations V. 485

Amherst College:—

Physical education and hygiene X. xli, 62

Union of amusement and exercise X. 69

Apparatus and directions in special cases X. 69

Attendance on gymnastic exercises and other college duties
compared X. 70

Attendance should be compulsory X. 70

Creation of department X. 66

Object X. 65, 66

Vital statistics X. 71

Duties of professor X. 67

Required to know condition of students in term time X. 70

Rules governing exercise X. 67

Time occupied in exercise X. 67

Gymnasium X. 68

Light gymnastics X. 68

Heavy gymnastics X. 70

Proportion and increase of near sight X. 72

Amherst College — *Continued.*

Time lost on account of sickness	X. 71
Decrease from commencement to close of college term . . .	X. 71
Student life compared with lives in other occupations . . .	X. 72

Anderson, Larz:—

Use of light wines	III. 116
------------------------------	----------

Animals:—

Disposition made of dead animals	I. 26
Number of animals slaughtered at Brighton	V. 155
Charbon in animals	II. 89
Parasites upon the domestic animals	III. 277; VI. 142
Keeping of hogs, goats, etc.	V. 470
Diseased animals	V. 471
Transportation of live stock	VI. 18, 77
Act of Congress to prevent cruelty to animals	VI. 88
Parasites affecting sheep	VI. 157
Chronic diseases of animals	VI. 158
Acute diseases of animals	VI. 158
Pleuro-pneumonia	VI. 159
Hoof and mouth disease	II. 4; VI. 159
Rinderpest	VI. 160
Anthrax	VI. 161
Texas cattle disease	VI. 163
Milk-sickness	VI. 165
Hog-cholera	VI. 165
Glanders	VI. 165

Anstie, F. S.:—

Uses of wine in health and disease	III. 108
--	----------

Anthrax:—

Anthrax, or malignant erysipelas	VI. 161
--	---------

Anthropometry:—

English anthropometry	X. 55
German anthropometry	X. 59
Roberts's Manual of Anthropometry	X. 58

Aphtha epizootica:—

Description of aphtha epizootica	II. 427
--	---------

Apothecaries:—

Education and business of apothecaries	I. 39
--	-------

Aqueduct:—

Cities and towns of Massachusetts supplied with water by aque- duct	VII. 194, 200
--	---------------

Architects:—

Architects should study ventilation	I. 52
---	-------

Arsenic:—

Arsenic in certain green colors	III. 6, 17
As a pigment	III. 19, 29
In artificial flowers	III. 21

Arsenic in certain green colors — *Continued.*

In dresses	III. 25
In confectionery and toys	III. 26
In paper	III. 30, 33
Signs of arsenical poisoning	III. 47
Methods of poisoning	III. 48
Susceptibility to poisoning	III. 51
Effect on workmen	III. 22, 53
Test for arsenic	III. 20
Case related by Dr. James Whitehead	III. 40
Case related by Dr. W. E. Rice	III. 41
Case related by Dr. John Jeffries	III. 43
Reference to cases	III. 46
Professor Taylor's examination of arsenic-bearing dust	III. 50
Poisoning from use of arsenical paper	VII. 547
Poisoning by arsenic	X. xxxix

Ash-closet: —

Ash-closet	VII. 187, 301
----------------------	---------------

Ashes:—

Disposal of ashes	IV. 29, 30
Use of ashes	X. 301

Asylums: —

Inebriate asylums or hospitals	VI. 17, 25
Hospitals for the insane	III. 151; X. xl, 1, 3
Certain needs of asylums for the insane	VIII. 421
Asylums for the insane compared with homes	VIII. 413
Number of asylums for the insane in England in January, 1874	VIII. 360
Accidents in asylums for the insane	X. 7
Construction	X. 5
Bedrooms	X. 13
Dining-rooms and passages	X. 9
Doors and locks	X. 11
Dormitories	X. 13
Drawing-rooms	X. 10
Electric bells and telephones	X. 14
Gymnasium	X. 10
Heating and ventilation	X. 11
Painting	X. 10
Roofs	X. 11
Water-closets	X. 14
Windows	X. 12
Work-shops	X. 10
Gheel principle	VIII. 328, 334, 430; X. 15
Public prejudice against asylums	X. 12
Site for asylums	X. 5

Augusta: —

Sewage irrigation at State Insane Asylum, Augusta, Me.	VII. 395
--	----------

Austria:—

Disposal of sewage VIII. 105

Ava-drinking:—

Manufacture and drinking of ava in the Feejee Islands . . III. 127

Babcock, J. F.:—

Analyses of milk IV. 14, 291

Bacteria:—

Bacteria in blood II. 94

Ball, Phinehas:—

The opportunity and possibility of utilizing the sewage of Worcester IV. 109

Barber's itch:—

Barber's itch III. 9, 264, 290

Modes of transmission III. 290, 293

Barking:—

Barking Sewage Farm VIII. 99

Barnyards:—

Barnyards near dwellings V. 237

Bartlett, H.:—

Communication to board of aldermen of consulting physicians
of Boston II. 56

Bartlett, J. C.:—

Influence of locality on consumption IV. 383

Bathing:—

Bathing by persons of consumptive tendencies V. 46

Baxter, J. H.:—

Classification of occupations X. 36

Beans:—

Baked beans and salt pork IV. 266

Bedford:—

Bedford Irrigation Farm VII. 378; VIII. 101

Beer:—

Beer-shops and prohibitory laws IV. 133

Percentage of alcohol in beer III. 125

Use of beer IV. 136

Belmont Slaughter-house:—

Case of city of Cambridge *v.* Niles Brothers XI. 5

Berkshire County:—

Prevalent diseases VII. 487

Area and population IX. 7, 8

Water-supply and sewerage IX. 8

Bichat:—

Bichat and Esquirol on the pathology of mental disease . . VIII. 333

Billings, J. S.:—

Heating and ventilation of hospitals V. 332

Birmingham:—

Method of disposal of sewage VII. 349

Birth:—

Births and deaths in various countries IV. 196

Premature birth IV. 198

Blackstone River:—

Examination of Blackstone River . IV. 82, 86, 88; V. 82, 83; VII. 21, 73

Mills, factories, etc., in the Blackstone-river Valley . . . VII. 74

Dry weather flow, etc. VII. 83

Analysis of water VII. 85, 156, 158

Additional notes by E. K. Clark VII. 86

Blackstone Village, water-supply, sewerage, etc. . . . VII. 86

Blake, C. H. M.:—

Report on sewerage of Worcester VII. 265

Blake, E. W.:—

Periodic fevers in and about New Haven, Conn. III. 64

Bleach-works:—

Pollution of water by bleach-works VII. 45

by cotton-bleaching VII. 42, 45

Blood:—

Value of blood I. 29, 33

Blood-albumen, its value and mode of production I. 33

Increased price of albumen I. 33

Use of albumen by calico-printers I. 30

Use of blood by sugar-refiners I. 30

Blood-cure in Brighton VI. 338

Blyth's process:—

Blyth's process of treating sewage IV. 46

Board of Health:—

General reports, I. 1; II. 2; III. 2; IV. 2; V. 2; VI. 2; VII. 2; VIII. 3;
IX. vii; X. vii; XI. 5

General principles of action I. 1

Establishment of the board I. 7

An Act to establish a State Board of Health I. 7; III. 327

Members of the board I. 8

Remarks of the senior member I. 8

State medicine in Massachusetts I. 9

Duties of board I. 12

By-laws I. 13

Subjects for special investigation . . . I. 3, 14; II. 7; III. 13; XI. 40

Subjects upon which special investigations and reports have been
made XI. 35

Organization of board I. 14

General circular I. 15

Appointment of correspondents II. 2

Circular II. 2

Legislative results of last year's labors II. 3

Board of Health—*Continued.*

Revision and codification of health laws	IV. 7
The value of health to the State	VI. 18
Nuisances, and the doings of the board thereupon	I. 6
Lock-ups	I. 6
Reports of secretary	I. 7; II. 19
Room for board meetings	I. 6
Expenses of the board, I. 6, 58; II. 17, 18; III. 13, 15; IV. 18; V. 28; VI. 23; VII. 19; VIII. 17; IX. xxxix; X. xlvii; XI. 42	
Death of Dr. George Derby	VI. 2
Address by Dr. Bowditch	VI. 3
Appointment of Dr. Draper as temporary secretary	VI. 4
Vote of thanks to Dr. W. L. Richardson	VII. 16
Boards of health	IX. xiv; X. xxxii
Local boards of health	IV. 8; V. 26; VI. 5
An Act relating to boards of health in the several cities	X. xxxii
Circular to local boards with view to more direct relation	IX. xiv
Circular, boards of health	XI. 31
Act relating to boards of health in the several cities of the Commonwealth	XI. 32
Board of Health of Edgartown	XI. 34
Draft of law recommended by board	X. xxxiii
Preventive medicine and the physician of the future	V. 22
Political economy of health	V. 25
Law appointing medical examiners	X. xxxvi
The regulation of the practice of medicine	X. xxxvii
Slaughtering for the Boston market	I. 3, 20
Report of Dr. H. G. Clark on condition of Brighton	I. 21
Slaughter-house piggeries	I. 23
Disposition made of dead horses, cattle, sheep, pigs, dogs, and condemned meat	I. 26
The remedies	I. 27
The value of blood	I. 29
Abattoirs	I. 31
Blood-albumen, its value and mode of production	I. 33
Abattoir of Paris	I. 36
Cases of alleged violation of the law submitted to the board	III. 2
Vote concerning prosecution of persons maintaining nuisances	III. 4
The Brighton butchers and the proposed abattoir	III. 5
Slaughtering, bone-boiling, and fat-melting	I. 26; III. 5
Foot and mouth disease in cattle, its effects on man	II. 4
Dr. Thorne's inferences	II. 4
Miller's River commission	IV. 4; V. xvi, 8
Correspondence with Charlestown officials	V. 10
Butchers' Slaughtering and Melting Association	IV. 9
Law concerning slaughter-houses and noxious and offensive trades, III. 2; IV. 7; V. xvi, 6; VI. 8, 13; VII. 2; VIII. 3; IX. vii; X. vii; XI. 5, 12	

Board of Health, Law concerning slaughter houses, etc. — *Continued.*

Report of Board of Health of Somerville	V. 11
Reply of the Board of Health	V. 12
Address of chairman of board to parties complained of. . .	V. 14
Brighton Abattoir	V. 20, 161; VI. 15, 19; VII. 4; IX. vii
Transportation of live stock	VI. 18
Our meat-supply and public health	VI. 19
The abattoir and the slaughter-houses in Brighton . . .	VII. 4
Notice to slaughterers and renderers	VII. 6
An Act to amend an Act to incorporate the Butchers' Slaughtering and Melting Association	VIII. 3
Case of George A. Sawyer v. State Board of Health . . .	X. ix
Opinions of Supreme Judicial Court	X. ix
Bradley Fertilizer Company	X. xviii; XI. 11
City of Cambridge v. Messrs. Niles Brothers	X. xviii; XI. 5
The absorbing of the soup from the Belmont Slaughter-house by means of muck	XI. 6
Certain rivers of Massachusetts, and water-supply of towns . .	V. 23
Housatonic basin	IX. 9
Hoosac basin	IX. 28
Mystic-pond water	II. 15
Milldams and water obstructions	III. 6
Use of zincked or galvanized iron for the storage or conveyance of drinking-water	V. 26
Investigation of the question on the use of running streams as common sewers	VII. 8
The filtration of potable water	IX. xxiv
Sewerage and sewage, the pollution of streams, the water-supply of towns	IV. 10; VIII. 6; IX. xv; X. xxiii
Act relating to pollution of streams	X. xxiii
Drains and sewers	VI. 5
Hydrographical survey	VI. 6
Little Pond in South Braintree	VI. 17
Sanitary hints	VII. 13
House-drainage	IV. 13; VII. 13; X. 300; XI. 25
Circular	XI. 25
Drainage for health	IV. 13
Surface-drainage of the metropolitan district	VII. 15
Sewerage	VIII. 11
Disposal of sewage	X. xx
Sewerage of the metropolitan district	IV. 6; V. 6
Common defects in house-drains	X. xlii
Act concerning the sewage of the State Prison in the town of Concord	IX. xviii
Homes for the people	II. 10
Boston Co-operative Building Association	III. 11
Crystal Palace, or Lincoln Building	III. 11

Board of Health — *Continued.*

House accommodations of the poor	IV. 15
Model lodging-houses and common tenements	I. 4; III. 10
Overcrowding of tenement-houses and want of clean streets in Boston	II. 5
The earth-closet	I. 5
Coal-gas from heating-apparatus	X. xlii
Air and some of its impurities	II. 15
A contribution to the study of ventilation	X. xliii
Composition of the air of the ground atmosphere	VI. 20
Ventilation of railroad-cars	VI. 20
Ventilation of schoolhouses	II. 14
Food of the people	IV. 13
Adulterations and impurities of food	III. 7; IV. 15
Diet at the Massachusetts State Prison	VI. 374
Adulteration of milk	IV. 14
Substances used for flavoring articles of food and drink	IV. 12
Impure ice	X. xl
Disease due to impure ice	VII. 14
Sale of poisons	I. 3, 38
Sales by apothecaries	I. 39
Sale and use of poisons	VI. 7
Poisoning by lead	II. 8
Arsenic in green colors	III. 6
Poisoning by arsenic	X. xxxix
Use and abuse of opium	III. 8
Circular, disinfection	XI. 19
Vegetable parasites	III. 9
Excavations in clay lands	V. 5
Health of Boston	III. 10
Sanitary condition of Cambridge	IX. xxvii
Sanitary condition of Lynn	VIII. 11
Sanitary condition of the State Prison at Charlestown	VI. 363
Mortality of prisons compared	VI. 371
Prison statistics	VI. 373
Causes of consumption	IV. 14
Asiatic cholera	V. 4
Cerebro-spinal meningitis	V. 24
Small-pox	II. 6; III. 9; IV. 2; V. 2
Small-pox in Ireland	II. 7
Trichina disease in Massachusetts	II. 8
Charbon, or malignant pustule	II. 9
Typhoid fever in Massachusetts	II. 9
Scarlet fever	IX. xxvi, xxxii
Circular	IX. xxxii
Hydrophobia	IX. xxviii
Diphtheria	IX. xxx

Board of Health — *Continued.*

Prevalent diseases	IX. xxxvi
Yellow fever epidemic	X. xxix
Syphilis and prostitution	X. xxvi
Prevalent diseases and causes of disease	XI. 13
Circular	XI. 16
Circular, registration	XI. 33
Mortality in the centres of population	I. 17
Mortality of the city of Boston	II. 13; VII. 15
Infant mortality	IV. 13
Registration of diseases	VI. 21; VII. 14
Registration of deaths and of diseases	VIII. 12; X. xxxviii
Bill to provide for the more accurate registration of vital statistics, IX. xiii	
Registration of vital statistics	X. xxxviii; XI. 33
Records of sickness	III. 12
Weekly reports of deaths	III. 13
Cremation and burial	VI. 20
Proper provision for the insane	III. 7
Disease of the mind	VIII. 13
Supervision of the insane	X. xxxvii
Hospital homes for the insane	X. xl
Health of the farmers of Massachusetts	V. 24
Circular, the care of young children	XI. 20
Growth of children	VIII. 12; X. xli
Health of minors in manufactories	II. 16
School hygiene	V. 25
Sanitation of public schools in Massachusetts	IX. xxiv
The department of physical education and hygiene in Amherst	
College	X. xli
Hospitals	V. 24
Cottage hospitals	IX. 22
Dangers from color-blindness	IX. xxii
Sewing-machines	II. 16; III. 8
The use of intoxicating liquors as a beverage	I. 5
Alcoholic drinks, their use and abuse	II. 11
Analysis of correspondence	III. 6; IV. 12
Inebriate asylums or hospitals	VI. 17
Intemperance	X. xxv

Boardman, W. E.:—

Use of zincked or galvanized iron for the storage and conveyance of drinking-water	V. 26, 487
Mallet on cast iron in simple contact with zinc immersed in fresh water	V. 492
W. R. Nichols, action of water upon zincked pipes	V. 495
The value of health to the State	VI. 18, 55

Boards of health:—

Boston Board of Health	III. 308
----------------------------------	----------

Boards of health — *Continued.*

The boards of health of cities and towns in Massachusetts, IV. 8;	
VI. 5; VII. 527; IX. xiv; X. xxxii, 11, 251; XI. 31	
Duties of local boards of health	V. 26, 449
Organization	V. 452
Health regulations	V. 453
Board-work	V. 455
Prevention of disease	V. 455
Privies	V. 455
House-offal	V. 465
Slaughter-houses, melting and rendering factories	V. 469
Hogs, goats, etc.	V. 470
Diseased animals	V. 471
Intramural burying-grounds	V. 472
Clothing and occupations	V. 473
Tenements, schools, public buildings	V. 474
Food and drugs	V. 475
Vaccination	V. 479
Restriction of disease	V. 480
Small-pox	V. 481
Need of boards of health in towns	V. 513; VIII. 11
Circular from State Board of Health with view to more direct relation	IX. xiv
Vote on new boards of health	IX. xiv
Local boards of health, and scarlet fever	IX. 322
An Act relating to boards of health in the several cities	X. xxxii
Draft of law recommended by board	X. xxxii, 111
Act relating to boards of health	XI. 32
Board of Health of Edgartown	XI. 34
Bone-boiling :—	
Fat-melting and bone-boiling	I. 26
Slaughtering, bone-boiling, and fat-melting	III. 5, 223
Act to incorporate the Butchers' Slaughtering and Melting Asso- ciation	III. 227
Act concerning slaughter-houses and noxious and offensive trades,	III. 229
Butchers accept Act to incorporate the Association	III. 240
Boston :—	
Slaughtering for the Boston market	I. 3, 20
Overcrowding of tenement-houses and want of clean streets in Boston	II. 5, 59
Neglect by health authorities	II. 56
Communication to the board of aldermen	II. 5
Communication to board of aldermen of consulting physicians of Boston	II. 56
Table of deaths from typhoid and typhus fever in Boston, 1846-67,	II. 125
Table of deaths from typhoid fever in Boston compared with a fixed number of the living in each year	II. 126

Boston — *Continued.*

Mortality of the city of Boston, II. 13, 349, 354; IV. 16, 450; VII. 15; IX. 389	
Outer air in Boston	II. 399
Air of schoolrooms in Boston	II. 400
Night stroll with an inspector of the London metropolitan police, and a similar walk in Boston	II. 183
Model lodging-house in Osborn Place, Boston	II. 219
Common tenement-house, or Crystal Palace so called	II. 220
Boston Co-operative Building Association	III. 11
Crystal Palace, or Lincoln Building	III. 11
Health districts of Boston	III. 350
Boston and Roxbury Milldam Corporation	III. 68
Building-law in Boston	III. 308
Sewerage of the metropolitan district	IV. 6, 61; V. 6
Cochituate water, II. 32, 35, 38; IV. 106, 458; V. 111, 116, 122; VI. 299; VII. 233	
Homes of the poor	IV. 396
Examination of Boston sewage	IV. 65, 66, 70
Health ordinance of Boston	IV. 437
Milk in Boston and vicinity	IV. 290
High death rate of Boston	V. 516
Boston live-stock market	VI. 110
Ground air, Boston Back Bay	VI. 213, 217, 218
Localities where cholera infantum, diphtheria, scarlet and typhoid fevers, principally prevailed	VII. 504
Mortality of Boston as compared with London, England	VII. 496, 551
Places needing drainage	VII. 511
Water-supply, drainage, etc.	VII. 232
The surface-drainage of the metropolitan district	VII. 15, 507
Water-supply and sewerage of Boston	VII. 232
Examination of the water-supplies of Boston	VII. 236
Areas of upland and lowland for Boston and neighboring towns	VII. 512
Boston schools	IX. 247
Examination of drains by Board of Health	X. 95, 99
Leaky drains in City Hospital	X. 96
Ventilation in Boston City Hospital	X. 231
Regulations concerning drains	X. 103
One-story ward in City Hospital	X. 231
Amount of air supplied per bed per hour	X. 233
Casella's air-meter	X. 237
Amount of air supplied and utilized per bed per hour	X. 245
Cold air introduced and warmed	X. 231
Distribution of air entering determined	X. 237
Vapor of muriate of ammonia	X. 238
Proper temperature and velocity of air to gain best diffusion	X. 238
Velocity of air measured	X. 233
Foul air	X. 232
Air-space	X. 231

Boston City Hospital — *Continued.*

Amount of carbonic acid in different parts of ward . . .	X. 243
Height of hospital wards	X. 246
Low relative humidity as affecting healthful condition of atmosphere	X. 236
Mortality decreased since new sanitary arrangements . . .	X. 247
Observations on heating and ventilation	X. 234
Examination of air for carbonic acid	X. 241
Bowditch, Ernest:—	
Leaky drains	X. 94
Bowditch, H. I.:—	
Remarks of Dr. Bowditch	I. 8
State medicine in Massachusetts	I. 9
Soil-moisture	I. 46
Houses for the people, convalescent homes, and the sewage question	II. 181
Letter to the State Board of Health	II. 182
A night stroll with an inspector of the London metropolitan police, and a similar walk in Boston	II. 183
Operations of philanthropists for the improvement of the dwellings of the poor in London	II. 193
The Peabody Buildings	II. 194
Miss Burdett-Coutts's market-house, lodging-house, and reading-room at Columbia Square	II. 199
"The Improved Industrial Dwelling Company," or the union of philanthropy with capital, and with perfectly successful result to both parties	II. 201
Jarrow Building Company	II. 210
Organized work among the poor	II. 212
Miss Hill's statement	II. 212
Summary of the whole investigations upon some of the means now in operation in England for improving the homes of the people, and the results of these operations on the health and morality of the occupants	II. 217
Comparison of the comparative values of a model lodging-house and common tenement-building in Boston	II. 218
Model lodging-house in Osborn Place, Boston	II. 219
Common tenement-house, or Crystal Palace so called . . .	II. 220
Remarks on the above statements	II. 222
Convalescent homes	II. 229
Sewage, what shall we do with it? The earth-closet. Irrigation of land. Drainage to the rivers or sea	II. 233
Earth-closet	II. 235
Final appeal	II. 242
Summary of English law in regard to common lodging-houses .	II. 243
Analysis of correspondence on the use and abuse of intoxicating drinks throughout the globe	III. 71

Bowditch, H. I., on the use, etc., of intoxicating drinks, etc. — *Continued.*

Extent of correspondence	III. 73
Love of stimulants a human instinct	III. 74
Intemperance according to isothermal lines	III. 75
Cosmic view of intemperance	III. 77
Stimulating climate of America	III. 79
Intemperance influenced by race	III. 79
Races educated to use strong liquors by bad laws and by other influences	III. 81
Intemperance influenced by fashion	III. 83
Open dram-shops	III. 83
Crime in consequence of intoxication	III. 85
Relative amount of intoxication in America and foreign countries	III. 89
Are all kinds of stimulants equally injurious?	III. 89
Alcohol needed medicinally	III. 92
Intemperance influenced by the cultivation of the grape	III. 95
Means to be taken to prevent intemperance in Massachusetts	III. 100
Common ground to be taken by those who desire to restrain intemperance	III. 103
Percentage of alcohol in various liquors	III. 105
Will total abstinence ever prevail universally?	III. 107
Treatment of the drunkard	III. 109
Summary	III. 109
Additional correspondence	III. 113
Massachusetts	III. 113
Madrid	III. 119
Russia, Sweden, and Norway	III. 121
Sweden and Norway	III. 122
Making ava in the Feejee Islands	III. 127
Kamtschatka	III. 128
Percentage of alcohol in beer	III. 125
Remarks to butchers	III. 231
Analysis of a correspondence on some of the causes or antecedents of consumption	IV. 14, 307
Letter from Dr. Bowditch	IV. 308
Circular, means of preventing consumption	IV. 310
General answers not referable to questions asked	IV. 370
Facts furnished by Rabbi Dr. Guinzburg	IV. 379
Letter from Dr. A. L. Haskins	IV. 380
Letter from Dr. Thomas Waterman	IV. 380
Letter from Dr. J. C. Bartlett	IV. 383
Letter from Dr. C. G. Rothe	IV. 387
Homes of the poor in Boston	IV. 395
Preventive medicine and the physician of the future	V. 22, 29
Residence	V. 38
Nutrition	V. 41

Bowditch, H. I., Preventive medicine, etc. — *Continued.*

Clothing	V. 45
Care of the skin, bathing	V. 46
Recreation	V. 48
Education	V. 50
Profession and trade	V. 51
Exercise	V. 52
Walking	V. 53
Running	V. 55
Dancing	V. 55
Horseback exercise	V. 56
Driving	V. 57
Gymnastics	V. 57
Boxing	V. 57
Bowling	V. 58
Rowing	V. 58
Swimming	V. 58
Remarks on death of Dr. George Derby	VI. 3
Inebriate asylums or hospitals	VI. 17, 25, 34
Allusion to Dr. Derby	VI. 27
Drunkenness now and formerly	VI. 28
Sentimental regard for the drunkard	VI. 29
Treatment of the drunkard by the law	VI. 29
No systematic effort hitherto made to cure the drunkard as one diseased	VI. 30
What should be done under the present circumstances?	VI. 31
Drunwards ought to be deprived of civil rights	VI. 32
Classification of drunkards in asylums	VI. 36
Sites for the asylum	VI. 39
Employments of the inmates	VI. 39
Workshops	VI. 40
Amusements	VI. 40
Superintendent	VI. 41
Attendants	VI. 42
Religious instruction and worship	VI. 42
Penal asylums	VI. 43
Asylum accommodations for women	VI. 43
Reports	VI. 43
Intemperance as a cause of pauperism	VI. 45
Circular	VI. 45
Sanitary hints	VII. 13, 409
Epidemic among horses, and the influence of bad hygienic conditions on the prevalence of it	VII. 411
Typhoid fever in Massachusetts	VII. 413
Disease in a house under unsanitary conditions	VII. 417
Bowditch, H. P.:—	
Growth of children	VIII. 12, 273; X. xli, 33

Bowditch, H. P., Growth of children. — *Continued.*

Method of investigation	VIII. 277
Results	VIII. 282
Comparative rate of growth of the two sexes	VIII. 283
Effect of race on size and on rate of growth	VIII. 291
Relation of height to weight	VIII. 301
Distribution of observations	VIII. 304
Weight of clothes	VIII. 305
Summary of results	VIII. 307
Conclusion	VIII. 308
Appendix	VIII. 310
Formulae of J. D. Runkle	VIII. 310
The relative importance of mode of life and of race in deter-	
mining the size of growing children	X. 35
Dr. Baxter's classification of occupations	X. 36
Anthropometrical methods	X. 55
Directions for compiling tables	X. 56

Bowling:—

Bowling by persons of consumptive tendencies	V. 58
--	-------

Boxing:—

Boxing by persons of consumptive tendencies	V. 57
---	-------

Bradford:—

Case of Bradford, Eng.	IV. 92
--------------------------------	--------

Bradley Fertilizer Company:—

Bradley Fertilizer Company	X. xviii; XI. 11
--------------------------------------	------------------

Bradley, W. H.:—

Leaky drains	X. 98
------------------------	-------

Brannenden, V. de:—

Liernur system	VII. 318
--------------------------	----------

Brass:—

Brass-foundries and electro-plate works	VII. 66
---	---------

Bread:—

Bread	IV. 261, 274
Bread badly made in Massachusetts	IV. 262
Parker-House bread	IV. 263

Breton:—

Breton Farm in England	II. 240; IV. 56; VII. 358, 360, 370, 371
----------------------------------	--

Brighton:—

Report by Dr. H. G. Clark	I. 21
Pig-pens of Brighton	I. 23
Death-rate of Brighton	I. 24
Future character and health of Brighton	I. 25
Report of town of Brighton	I. 21
Nuisances in Brighton	II. 3
"Foot and mouth disease" in Brighton	II. 428
Brighton butchers and the proposed abattoir	III. 5
Brighton Abattoir	V. 20, 153, 164; VI. 15, 19

Brighton — *Continued.*

Stock-yards at Brighton	VI. 129
Blood-cure in Brighton	VI. 338
The abattoir and slaughter-houses in Brighton	VII. 4
Sewerage of abattoir	VII. 105
Description of the Brighton Abattoir	IX. vii

Bristowe and Holmes: —

Hospitals	V. 322
---------------------	--------

Brown, F. H.: —

General Index	XI. 43
-------------------------	--------

Brunetti: —

Brunetti's method of cremation	VI. 256
--	---------

Bucknill, J. C.: —

Care of the insane	VIII. 361
Supervision of the insane	VIII. 417

Buenos Ayres: —

Yellow fever and filth	VIII. 127
----------------------------------	-----------

Buffalo: —

Buffalo stock-yards	VI. 126
-------------------------------	---------

Building: —

Boston Co-operative Building Association	III. 11
Building law in Boston	III. 308
Drainage of building-sites	IV. 178
Building Act	IV. 436
Its complexity	IV. 438
Buildings as elements of wealth	V. 350
Defective buildings	V. 474

Burdett-Coutts: —

Miss Burdett-Coutts's market-house, lodging-house, and reading-room at Columbia Square	II. 199
--	---------

Burial: —

Cremation and burial	VI. 20, 241
Intramural interment	VI. 266
Interment at the present day	VI. 276
Fleck's examination of well-water from Dresden cemeteries	VI. 281
Sickness induced or aggravated by proximity of dwellings to cemeteries	VI. 284
Examination of well-water from vicinity of cemeteries, VI. 292,	295, 297, 298
Medical opinions of burial and cremation	VI. 301
Bibliography	VI. 315
Intramural burying-grounds	V. 472; VI. 267
Regulations for burial-grounds in England	VI. 277

Butchers' Hide and Melting Association, New York: —

Description of the abattoir	I. 27
---------------------------------------	-------

Butchers' Slaughtering and Melting Association: —

Act of incorporation	III. 227; VI. 197
--------------------------------	-------------------

Butchers' Slaughtering and Melting Association — *Continued.*

Conference with butchers	III. 231
Remarks of Dr. Bowditch	III. 231
Report of committee of butchers on New York slaughter-houses,	III. 233
Proposition of the butchers	III. 235
Objections to the propositions	III. 238
Butchers accept Act to incorporate the association	III. 240
Butchers' Slaughtering and Melting Association	IV. 9
Reports of the Butchers' Slaughtering and Melting Association,	IV. 443; VI. 187
Regulations of the Butchers' Slaughtering and Melting Association	V. 158; VI. 190
Approval of Board of Health with sanitary regulations,	V. 161; VI. 193
Act to amend an Act to incorporate the Butchers' Slaughtering and Melting Association in Brighton	VIII. 3
Butter:—	
Examination of pearl butter	VI. 196
By-laws:—	
By-laws of the State Board of Health	I. 13
Calico:—	
List of materials used for printing and dyeing calico	VII. 42
Turkey-red dyeing	VII. 44
Calico-printers:—	
Use of albumen by calico-printers	I. 30
California:—	
Use of wine in California	IV. 141
Cambridge:—	
Miller's River in East Cambridge and Somerville	III. 70
Outer air in Cambridge	II. 404
City of Cambridge with reference to Miller's River nuisance	V. 11
The responsibility of Cambridge and Somerville for nuisances	V. 18
Sanitary condition of Cambridge	IX. xxvii, 329
Natural conditions affecting health	IX. 331
Situation	IX. 331
Topography	IX. 331
Geological structure	IX. 331
Temperature, rainfall, etc.	IX. 333
Population	IX. 333
Rate of increase	IX. 334
Nationality	IX. 334
Age distribution	IX. 335
Occupation	IX. 335
Illiteracy	IX. 335
Pauperism	IX. 335
Convicts	IX. 336
Artificial conditions affecting public health	IX. 336

Cambridge, Artificial conditions affecting public health — *Continued.*

Water-supply	IX. 336
Analysis of Cambridge's water-supply	IX. 338
Cambridge well-waters	IX. 345
Lowlands	IX. 346
Sewerage	IX. 347
House-drainage	IX. 350
Removal of night-soil, house-offal, etc.	IX. 351
Dwellings	IX. 353
Public buildings	IX. 353
Dispensary	IX. 353
Hospital	IX. 354
Board of Health	IX. 354
Rates of mortality	IX. 354
Registration	IX. 354
Annual death rates, 1860-77	IX. 355
Mortality at different ages	IX. 356
Mortality of different races	IX. 358
Prevailing diseases	IX. 358
Death rates from consumption for four census years	IX. 362
Health of different districts	IX. 363
Concluding remarks	IX. 372
Petition of city of Cambridge <i>v.</i> Messrs. Niles Brothers, X. xviii, 111; XI. 5	
Water-supply	X. xxv, 117
Analysis of water and ice	X. 119
Camp:—	
Insanitary condition of camp at South Framingham	VII. 549
Canned fruits and vegetables:—	
The action of acid fruits upon tin cans	III. 132
Canterbury:—	
Convocation of Canterbury	IV. 136
Cape Ann:—	
Climatic peculiarities of Cape Ann	II. 73
Carbonic acid:—	
Examination of air for carbonic acid	X. 241
Carbonic acid in ground atmosphere	VI. 208, 210, 212
Rapid diffusion of carbonic acid	VI. 224
Relation of carbonic acid to hot cast iron	X. 78, 79
Carpeuter, Alfred:—	
Contaminated water:—	VIII. 114
Carpenter, P. P.:—	
Schools in England	V. 421
Cattle:—	
Foot and mouth disease in cattle	II. 4
Use of milk from cows affected with "foot and mouth disease,"	II. 425
Capacity of cattle-cars	VI. 98, 99
Act of Congress on treatment of cattle	VI. 88

Cattle — *Continued.*

Quality of beef cattle	VI. 118, 119
Space per animal	VI. 100
Requirements of food	VI. 96

Cellars:—

Damp cellars	I. 53
Drainage of cellars	IV. 182
Damp and wet cellars	VII. 227
Cellars of school-buildings	IX. 233
Flooding cellars	VIII. 150
Ventilation, drainage, and cleanliness	X. 300

Cerebro-spinal meningitis:—

Cerebro-spinal meningitis in Massachusetts	V. 24, 261, 268, 270, 276, 285
Circular	V. 270
Tabular statement of cases	V. 272
Deaths from cerebro-spinal meningitis in Boston	V. 279
Analysis of 517 cases	V. 307
Deaf-mutism consequent on cerebro-spinal meningitis	V. 308
Has it prevailed among animals?	V. 309
Causes	V. 310
Epidemic influence	V. 311
Connection with insanitary surroundings	V. 311
History	V. 263, 267
Description	V. 264
Towns affected in 1873	V. 276, 285

Certificates:—

Law for certificates of insanity of State of New York	VIII. 427
---	-----------

Cesspools:—

Dangers to wells from cesspools	VII. 190
Cesspool or tank for house-grease	VII. 443
Cesspools	X. 302

Chapin, C. O.:—

Filtering-gallery on the Westfield River	IX. 180
--	---------

Charbon:—

Charbon, or malignant vesicle, in Massachusetts	II. 9, 85
Symptoms	II. 87
In animals	II. 89
Of the morbid changes in the tissues and internal organs	II. 90
Theoretical considerations as to the nature of the morbid poison or contagion in charbon	II. 91
Methods and sources of infection	II. 97
Observations on the epidemic at Walpole	II. 99
On the value and application of disinfectants or antiseptics	II. 104

Charcoal:—

Charcoal-closet	VII. 300
---------------------------	----------

Charles River:—

Charles River	V. 90
-------------------------	-------

Charles River — *Continued.*

Examination of Charles River	V. 92, 152; VII. 21, 97
Charles River as a source of water-supply	V. 142
Mills, factories, etc., on the Charles-river Valley	VII. 98
Additional notes by E. K. Clark	VII. 103
Analysis of statistics	VII. 105
Summer flow, etc.	VII. 106
Analysis of water	VII. 107, 157, 164

Charlestown: —

Tide-mill in Charlestown	III. 69
Miller's River district	V. 10
Sanitary condition of the State Prison at Charlestown	VI. 363

Cheltenham: —

Cheltenham Sewage Farm	VIII. 99
----------------------------------	----------

Chesbrough, E. S.: —

Sewerage: its advantage and disadvantages, construction and maintenance	VIII. 11, 137
Surveys	VIII. 143
Preliminary study	VIII. 143
What should be admitted into the sewers	VIII. 149
Soil-water	VIII. 150
Flooding cellars, etc.	VIII. 150
Sizes of sewers	VIII. 151
Forms of sewers	VIII. 153
Material and thickness of sewers	VIII. 155
Depth of sewers	VIII. 158
Double system of sewers	VIII. 159
Access to sewers	VIII. 159
Branches and junctions	VIII. 160
House-drainage	VIII. 160
Supply of water	VIII. 161
Flushing	VIII. 161
Ventilation of sewers	VIII. 163
Contracts, specifications, and inspection	VIII. 164
Maintenance of sewers	VIII. 165
Records	VIII. 166
Disadvantages considered	VIII. 166

Chicopee: —

Sewer in Chicopee	VII. 226
Water-supply and sewerage of Chicopee	VII. 246

Chicopee River: —

Examination of the water-basin of Chicopee River	VII. 21, 109
Notes of C. D. Ward	VII. 109
Mills, factories, etc., in the Chicopee Valley	VII. 110
Analysis of statistics for certain points in the Chicopee Valley	VII. 121
Analysis of water	VII. 122, 153, 166
Sewerage of towns in Chicopee-river Valley	VII. 119

Children:—

Health of minors employed in manufactories	II. 16, 409
Infant mortality	IV. 13, 193
Table showing ratio of deaths of children to births	IV. 196
Premature birth	IV. 198
Care of infancy	IV. 202
Diseases of infancy and childhood	IV. 204
Food and nutrition	IV. 206
Distillery milk	IV. 209
Foundlings	IV. 221
Growth of children	VIII. 12, 273; X. xli, 33
Method of investigation	VIII. 277
Results	VIII. 282
Comparative rate of growth of the two sexes	VIII. 253
Effect of race on size and on rate of growth	VIII. 291
Observations of Baxter, Boudin, Cowell, Gould, Quetelet, and Villermé	VIII. 292, 293
Relation of height to weight	VIII. 301
Distribution of observations	VIII. 304
Weight of clothes	VIII. 305
Summary of results	VIII. 307
Scarlet fever as a disease of the young	IX. 268
Formulae of J. D. Runkle	VIII. 310
The relative importance of mode of life and of race in determin- ing the size of growing children	X. 35
Dr. Baxter's classification of occupations	X. 36
Anthropometrical methods	X. 55
Directions for compiling tables	X. 56
The care of young children	XI. 20

Cholera:—

Asiatic cholera	V. 4
Cholera epidemics of London 1848-49 and 1853-54	VII. 31
Cholera in London 1866	VII. 34

Cholera infantum:—

Cholera infantum	X. 287
----------------------------	--------

Cicuta maculata:—

Three cases of poisoning from eating cicuta maculata	VII. 546
--	----------

Circulars:—

Circular issued by State Board of Health	I. 15
Medical correspondents	II. 2
Health of towns	II. 52
Use of intoxicating liquors	II. 256
Health of minors employed in manufactories	II. 410
Vaccination	III. 299
Disposal of refuse materials	IV. 29, 30
Food	IV. 241
Means of preventing consumption	IV. 310

Circulars — *Continued.*

Cerebro-spinal meningitis	V. 270
Asiatic cholera	V. 3
Health of the farmers of Massachusetts	V. 191
School hygiene	V. 395
Intemperance	VI. 45
Use of running streams as sewers, etc.	VII. 176
Relation of most prevalent diseases to exposure to sewer-gases, etc. (Boston)	VII. 498
Registration of deaths and of diseases	V. 232; VII. 482; VIII. 231
Prevalent diseases	XI. 16
Disinfection	XI. 19
The care of young children	XI. 20
House-drainage	XI. 25
Boards of health	IX. xiv; XI. 31
Registration	XI. 33
Diphtheria	IX. xxx
Pollution of streams	IX. 3, 55, 66, 73
Filtration of potable water.	IX. 177
Nashua-river Basin	VIII. 22
Drainage, etc.	X. 300

Cisterns: —

Dangers of cisterns	VII. 192
-------------------------------	----------

Cities and towns: —

Mortality in the centres of population	I. 17
Reports from towns concerning disease and its causes	II. 54
Boards of health of cities and towns in Massachusetts	IV. 8
The water-supply of towns	IV. 10, 19, 99
Wakefield Board of Health regulations	IV. 464
American cities	V. 369
Growth of American cities	V. 367
Diphtheria	VII. 529, 534

Cities. *See* "Towns."

Clark: —

Process for softening hard water	IX. 140
--	---------

Clark, E. K.: —

Notes on Blackstone River	VII. 86
Charles River	VII. 103
Hoosac River	IX. 28
Housatonic River	IX. 9
Nashua River	VIII. 24, 38

Clark, H. G.: —

Report on Brighton in 1866	I. 21
--------------------------------------	-------

Clark, Theodore: —

Cement and earthenware drains	X. 95
---	-------

Clarke, E. C.: —

Common defects in house-drains	X. xlii, 85
--	-------------

Clarke, E. C., Common defects in house-drains — *Continued.*

Causes of leaking	X. 97
Brick more liable to break than cement or iron	X. 96
Defects of cement and earthenware	X. 95, 105
Instances of choked and defective drains	X. 88
Efficient essential conditions of drains	X. 87
Form	X. 91
Inclination or pitch	X. 93
Size	X. 89
Smoothness	X. 92
Tightness	X. 94
Height at connection with sewer	X. 102
Hole into sewer smaller than drain	X. 103
Causes of leaks	X. 96
More liable to occur in brick than in cement or iron drains	X. 97
Sickness	X. 96, 98
Materials	X. 92, 104
Durability	X. 104
Mode of connecting with sewers	X. 100
Regulations in Boston	X. 103
Pitching the wrong way	X. 93
Want of tightness the common defect	X. 95
Clay lands: —	
Excavations in clay lands	V. 5
Climate: —	
Stimulating effect of American climate	III. 79
Clinton: —	
Snuff-dipping in Clinton	IX. 399
Clothing: —	
Clothing of persons of consumptive tendencies	V. 45
Clothing	V. 473
Clouston, T. S.: —	
Care of the insane	VIII. 368
Hospital homes for the insane	X. xl
An asylum or hospital home for two hundred patients	X. I
Introductory	X. 3
Principles of construction, etc.	X. 5
Description of the various parts of the asylum	X. 15
Coal: —	
Composition of various kinds of coal	VII. 6
Anthracite coal as fuel	X. 75
Open fires	X. 83
Coal-gas from heating-apparatus	X. xlii, 75
Composition of coal-gas	X. 77
Detecting presence of coal-gas	X. 82
Disagreeable effects of coal-gas	X. 76
Escape of gas	X. 79, 81

Coal, Coal-gas from heating-apparatus — *Continued.*

Poisoning by inhalation	X. 75
How to avoid breathing coal-gas	X. 82
Treatment of persons insensible from breathing coal-gas	X. 84

Cochituate:—

Action of Cochituate water on lead pipe	II. 32
Analysis of Cochituate water	II. 35; VI. 299
Literature of the subject	II. 38
Cochituate water	IV. 106, 458; V. 111
Examination of Cochituate Lake and its sources of supply	V. 116
Lake Cochituate	VII. 233
Change in character of Cochituate water	V. 122

Coffee:—

The adulteration of coffee	III. 136
Coffee and tea	IV. 270

Cogswell, E. R.:—

Sanitary condition of Cambridge	IX. xxvii, 329
Natural conditions affecting health	IX. 331
Situation	IX. 331
Topography	IX. 331
Geological structure	IX. 331
Temperature, rainfall, etc.	IX. 333
Population	IX. 333
Rate of increase	IX. 334
Nationality	IX. 334
Age distribution	IX. 335
Occupation	IX. 335
Illiteracy	IX. 335
Pauperism	IX. 335
Convicts	IX. 336
Artificial conditions affecting public health	IX. 336
Water-supply	IX. 336
Analyses of Cambridge water-supply	IX. 338
Cambridge well-waters	IX. 345
Lowlands	IX. 346
Sewerage	IX. 347
House-drainage	IX. 350
Removal of night-soil, house-offal, etc.	IX. 351
Dwellings	IX. 353
Public buildings	IX. 353
Dispensary	IX. 353
Hospital	IX. 354
Board of Health	IX. 354
Rates of mortality	IX. 354
Registration	IX. 354
Annual death rates, 1860-77	IX. 355
Mortality at different ages	IX. 356

Cogswell, E. R., Rates of mortality — *Continued.*

Mortality of different races	IX. 358
Prevailing diseases	IX. 358
Death-rates from consumption for four census years . . .	IX. 362
Health of different districts	IX. 363
Concluding remarks	IX. 372

Coleridge:—

Views of insanity	VIII. 338
-----------------------------	-----------

Color-blindness:—

Dangers from	IX. xxii, 97
Acquired by disease or injury, by use of certain medicines, alcohol, and tobacco	IX. 125
Bibliography	IX. 130
Concealment of, by persons affected	IX. 114
Danger from, great in railroad employés, pilots, etc. . .	IX. 102, 104
Wilson on color-blindness	IX. 102
Definition	IX. 100
History	IX. 101

Examination to detect color-blindness:—

Defective methods	IX. 103
Difficulty of, in the United States	IX. 127
In Austrian navy	IX. 110
Government railroad employés in Bavaria and Russia . .	IX. 109
Of professors and students of Harvard University and the Institute of Technology	IX. 111
Statistics	IX. 106, 107

Heredity of:—

Observations of Cunier, Hochecher, and Wilson	IX. 124
Pliny Earle	IX. 123
Ideas of color by the blind	IX. 120
Statistics of examination of inmates of the Perkins Institution for the Blind	IX. 121
Marine accidents from color-blindness (Romberg) . . .	IX. 122
Measures now taken for protection in the marine and railways .	IX. 125
Names of colors misused by the uneducated	IX. 119
No legislation in England	IX. 102

Observations on color-blindness:—

By Donders in Holland	IX. 109
Favre in France	IX. 104, 108
Peris in France	IX. 105
Hansen in Denmark	IX. 108
Hjort in Norway	IX. 109
Holmgren in Sweden	IX. 112, 114
Noel in France	IX. 104
Quaglino in Italy	IX. 109
Stilling in Cassel	IX. 109
Perception of colors by the color-blind	IX. 100

Color-blindness — *Continued.*

Reports on color-blindness by Huddart, Dalton, Seebeck, and

Wilson	IX. 101
Best colors for signals	IX. 104
Statistics of color-blindness	IX. 110
Summary and conclusions	IX. 128
Recommendations for legislation	IX. 129
Testing for color-blindness, Stilling	IX. 118
Variation in ratio of persons affected explained	IX. 111
Vision may be otherwise superior	IX. 100

Columbus: —

Filtering-works at Columbus, O.	IX. 151
---	---------

Comb-manufactories: —

Pollution of streams by comb-manufactories	VIII. 37
--	----------

Concord: —

Sewage of State Prison at Concord	IX. xviii; X. xx, xxiv
---	------------------------

Concord River: —

Sudbury and Concord Rivers	V. 96
Examination of Sudbury and Concord Rivers	V. 98

Confectionery: —

Adulteration of confectionery	IV. 390
Arsenic in confectionery	III. 26

Connecticut: —

Prevailing diseases of Connecticut-river Valley	VII. 487
---	----------

Conolly: —

Treatment of the insane	VIII. 339
-----------------------------------	-----------

Consulting-physicians: —

Communication to board of aldermen from consulting-physicians of Boston	II. 56
--	--------

Consumption: —

Prevention of consumption	I. 45
Soil-moisture as a cause of consumption	I. 46
Mortality from consumption in Massachusetts	I. 47
Diseases propagated by contagion	I. 49
Correspondence on some of the causes of consumption	IV. 14, 307
Letter from Dr. Bowditch	IV. 308
Circular, means of preventing consumption	IV. 310
Influence of change of residence	IV. 382
History of a family	IV. 385
Is it hereditary?	IV. 311
Can it be prevented when hereditary?	IV. 316
Means to prevent its development when inherited	IV. 318
Is it promoted by parents' drunkenness?	IV. 333
Is it promoted by drunkenness of the individual?	IV. 334
Is it prevented by drunkenness?	IV. 336
Is it prevented by total abstinence from alcohol?	IV. 339
Is it promoted by total abstinence from alcohol?	IV. 341

Consumption — *Continued.*

Is it caused by over-study ?	IV. 342
Is it caused by over-work in trades ?	IV. 344
Is it caused by certain trades ?	IV. 345
Is it caused by over-work of any kind ?	IV. 348
Is it promoted by severe bodily injuries ?	IV. 350
Is it promoted by mental trouble ?	IV. 351
Is it promoted by marriage ?	IV. 352
Is it checked by child-bearing ?	IV. 354
Is it promoted by inordinate sexual indulgence ?	IV. 356
Is it contagious ?	IV. 359
Is it promoted by an exposed residence ?	IV. 363
Is it promoted by a wet residence ?	IV. 365
Influence of Jewish customs	IV. 379
Facts furnished by Rabbi Dr. Guinzburg	IV. 379
Letter of Dr. A. L. Haskins	IV. 380
Letter of Dr. Thomas Waterman	IV. 380
Consumption in Housatonic-river Basin	IX. 22
Influence of locality on consumption	IV. 383
Letter from Dr. C. G. Rothe	IV. 387
Influence of a damp location upon consumption	V. 227
Prevention of consumption in persons disposed to it by inheritance	V. 37
Cause of consumption in prisons	VI. 374
Relative mortality from consumption in the towns of the Housatonic Basin	IX. 23

Contagion:—

Contagious diseases in schools	IX. xxiv, 243
Rules for preventing the spread of contagious diseases in schools,	IX. xxiv, 252
Source and methods of contagion of scarlet fever	IX. 270
Contagiousness of scarlet fever	IX. 273
Contagious diseases Act	X. xxvii

Contents:—

Tables of contents, I. iii; II. v; III. v; IV. v; V. v; VI. v; VII. v; VIII. v; IX. v; X. v; XI. 4
--

Convalescent homes:—

Convalescent homes	II. 229
------------------------------	---------

Cooking:—

Need of more careful cooking	IV. 274
Food and cooking	V. 375
Frying of meat	V. 265

Co-operative Building Company:—

Co-operative Building Company in Boston	IV. 432
---	---------

Correspondents:—

Appointment	II. 2
Circular relating to medical correspondents	II. 2

Cottage hospitals:—

Cottage hospitals	V. 327; IX. xxii, 81
Bibliography	IX. 95
First established in England	IX. 83
General character	IX. 83
Hospital accommodations inadequate in the large cities of Massachusetts	IX. 84
Hospitals in Massachusetts outside of Boston	IX. 85
House of Mercy, Pittsfield	IX. 86

Cotton manufacture:—

Pollution of rivers by cotton manufactories	VII. 42, 43
Materials used for printing and dyeing calico	VII. 42
Bleach-works	VII. 45
Cotton-bleaching	VII. 45

Coventry, Eng.:—

Sewage irrigation	VIII. 82
-----------------------------	----------

Cowles, Edward:—

A contribution to the study of ventilation	X. xliii, 229
Record of observations on heating and ventilation	X. 234
Examination of air for carbonic acid	X. 241
Dr. G. W. Gay on results of treatment in the wards	X. 247

Coxe, James:—

Care of the insane	VIII. 371
------------------------------	-----------

Cremation:—

Cremation and burial	VI. 20, 241
Cremation, its history and methods	VI. 246
Circular	VI. 284
Medical opinion of burial or cremation	VI. 301
Bibliography	VI. 315
Method of Brunetti	VI. 256
Gorini	VI. 256
Polli	VI. 255
Siemens	VI. 258
Recapitulation of methods	VI. 265
Recent actual cremation	VI. 259
Sir Henry Thompson	VI. 263
Cremation of the poet Shelley	VI. 252

Crewe, Eng.:—

Crewe Sewage Farm	VII. 357
-----------------------------	----------

Crime:—

Crime in consequence of intoxication	III. 85
--	---------

Croup:—

Croup	X. 287, 293
-----------------	-------------

Croydon, Eng.:—

Typhoid fever due to impure water	VIII. 119
Croydon Sewage Farm	VII. 358

Cruelty:—

Cruelty to animals in transportation and slaughtering . . . V. 22

Crystal Palace:—

Crystal Palace, or Lincoln Building . . . III. 11; IV. 432

Cummings, John:—

Transportation of animals . . . VI. 104

Cutter, E. G.:—

Poisoning from use of arsenical paper . . . VII. 547

Daltonism:—

Definition of Daltonism . . . IX. 101

Dana, S. A.:—

Merrimac water . . . V. 66

Dancing:—

Dancing by persons of consumptive tendencies . . . V. 55

Danvers:—

Milldam in Danversport . . . III. 49, 170

Sewage of Danvers Asylum for the Insane . . . X. xx

Day, A.:—

Letter concerning intemperance . . . III. 113

Dead:—

Intramural burying-grounds . . . V. 472

Cremation and burial . . . VI. 20

Dead animals:—

Disposition made of dead animals . . . I. 26

Deaths:—

Mortality in the centres of population . . . I. 17

Mortality from consumption in Massachusetts . . . I. 47

Death-rates of Brighton . . . I. 24

Diminished mortality in New York . . . I. 56

Mortality of the city of Boston . . . II. 13

Table of deaths of persons above five years of age from typhoid fever in Massachusetts during the years 1859-68 . . . II. 114

Table showing relative mortality for ten years from typhoid fever in persons above five years of age in the larger and smaller cities and towns . . . II. 118

Table of deaths from typhoid and typhus fevers in Boston, 1846-67 . . . II. 125

Table of deaths from typhoid fever compared with a fixed number of the living in each year . . . II. 126

Mortality of the city of Boston in 1870 . . . II. 349

Analysis of the mortality of Boston in 1870 . . . II. 354

Weekly report of deaths . . . III. 13

Infant mortality . . . IV. 13, 193

Table showing ratio of deaths of children to births . . . IV. 196

Death-rates in infancy . . . IV. 200

Deaths in infancy in various countries . . . IV. 197

Deaths — *Continued.*

Deaths and births in various countries	IV. 196
Deaths from cerebro-spinal meningitis in Boston	V. 279
Mortality of prisons compared	VI. 371
Death-rates according to the length of sentences	VI. 373
Death-rates of certain towns in Massachusetts	VI. 392; VIII. 497
Death-rates of certain cities of the United States	VI. 361
Mortality-rates of East Boston from 1870 to 1874	VI. 335
Population and death rates for 1875	VII. 550
Death-rates of Dublin, Edinburgh, Glasgow, Leicester, Liverpool, and Manchester for 1871-72	VII. 28
Mortality of Boston	VII. 15
Registration of deaths and of diseases	VIII. 12
Mortality from scarlet fever	IX. 257
Death-rates for the year	X. 284
Deaths and meteorology	X. 286
Circular	VIII. 233
Information from physicians	VIII. 234
Information from town and city clerks	VIII. 248
History of registration of deaths	VIII. 258
Faults in our law	VIII. 261
Importance of registration	VIII. 264
Decaisne, Dr.:—	
Sewing-machines	III. 185
Dedham:—	
Water-supply, sewerage, etc.	VII. 104
Derby, G.:—	
The prevention of disease	I. 42
Dr. Bowditch on soil-moisture	I. 46
Mortality from consumption in Massachusetts in each of the past sixteen years	I. 47
Air	I. 51
Damp cellars	I. 53
Drainage of towns in England	I. 46
Disinfecting power of earth	I. 54
Architects should study ventilation	I. 52
Prevention of typhoid fever	I. 44
Quality of water	I. 55
Poisoning by lead pipe used for the conveyance of drinking- water	II. 8, 21
Action of water of Lake Cochituate on lead pipe	II. 32
Literature of the subject	II. 38
Trichina disease in Massachusetts	II. 45
Health of towns	II. 51
Communication to mayor and aldermen from consulting-physi- cians of Boston	II. 56
Causes of typhoid fever in Massachusetts	II. 109

Derby, G. — *Continued.*

Table of deaths of persons above five years of age from typhoid fever in Massachusetts during the ten years 1859-68 . . .	II. 114
Table showing relative mortality for ten years from typhoid fever in persons above five years of age in the larger and smaller cities and towns	II. 118
Circular, typhoid fever	II. 118
Table of deaths from typhoid and typhus fever in Boston 1846-67, . . .	II. 125
Table of deaths from typhoid fever in Boston compared with a fixed number of the living in each year	II. 126
Shaker communities	II. 161
Dr. Nathan Smith's views on typhoid fever	II. 163
Dr. James Jackson's remarks on typhoid fever	II. 174
Mortality of the city of Boston in 1870	II. 349
Analysis of the mortality of Boston in 1870	II. 354
Examination of the water of Mystic Pond and of its sources of supply	II. 385
Report of W. R. Nichols	II. 387
Air, and some of its impurities	II. 395
Outer air in Boston	II. 399
Rooms of the Institute of Technology	II. 400
Air of schoolrooms in Boston	II. 400
Air of halls, etc., in Boston	II. 402
Outer air in Cambridge	II. 404
Air of a recitation-room, Harvard College	II. 404
Microscopic examination of dust	II. 405
Health of minors employed in manufactures of cotton, woollen, silk, flax, and jute	II. 16, 409
Circular to manufacturers	II. 410
Abstract of manufacturers' replies	II. 412
Table showing comparative mortality among minors in the State of Massachusetts at large and those employed in mills, . . .	II. 420
Milldams and other water obstructions	III. 59
Dr. E. W. Blake on periodic fevers in and about New Haven, Conn.	III. 64
Boston and Roxbury Milldam Corporation	III. 68
Tide-mills in Salem	III. 68
Tide-mill in Charlestown	III. 69
Milldam in Danversport	III. 70
Miller's River in East Cambridge and Somerville	III. 70
Slaughtering, bone-boiling, and fat-melting	III. 223
Act to incorporate the Butchers' Slaughtering and Melting Association	III. 227
Act concerning slaughter-houses and noxious and offensive trades	III. 229
Conference with butchers	III. 231
Remarks of Dr. Bowditch	III. 231

Derby, G., Slaughtering, bone-boiling, and fat-melting. — *Continued.*

Report of committee of butchers on N. Y. slaughter-houses	III. 233
Proposition of the butchers	III. 235
Objections to the propositions	III. 238
Butchers accept Act to incorporate the association	III. 240
Small-pox in Massachusetts	III. 9, 297
Circular on vaccination	III. 299
Sewerage, sewage, the pollution of streams, the water-supply of towns	IV. 10, 19
Dry-earth system	IV. 22
Water-carriage system	IV. 25
Ventilation of house-drains	IV. 26
Sewage from other sources	IV. 28
Swill	IV. 29
Ashes	IV. 29, 30
Circular, disposal of refuse materials	IV. 29
Meat and vegetable refuse	IV. 30
Sewage	IV. 31
Sewers	IV. 36
Treatment of sewage	IV. 40
Composition of English sewage	IV. 43
Lime process	IV. 45
Blyth's process	IV. 46
Holden's process	IV. 46
A B C process	IV. 47
Phosphate process	IV. 51
Process described by David Forbes	IV. 51
Sewage irrigation	IV. 55
Breton Farm	IV. 56
Treatment and utilization of sewage in Massachusetts	IV. 61
Examination of Boston sewage	IV. 65, 70
Sewage of Worcester	IV. 74
Examination of Worcester sewage	IV. 77
The effect of sewage and manufacturing refuse on running streams	IV. 81
Blackstone River	IV. 82, 86
Mill Brook, Worcester	IV. 83, 84
Examination of Blackstone River	IV. 88
Merrimac River at Lowell	IV. 89
Examination of Merrimac River	IV. 90
Condition of certain English rivers	IV. 91
Case of Bradford, England	IV. 92
River Irwell in England	IV. 94
River Tweed in England	IV. 95
Alleged self-purification of running streams	IV. 96
The water-supply of towns	IV. 99
Lakes and "great ponds"	IV. 102

Derby, G., The water-supply of towns, etc. — *Continued.*

Great ponds public property	IV. 105
Cochituate water	IV. 106
The food of the people of Massachusetts	IV. 13, 235
Circular on food	IV. 241
Replies of correspondents	IV. 242
Letter from Dr. John Dole	IV. 257
Bread	IV. 261
Variety in food	IV. 263
Frying of meat	IV. 265
Pastry and cakes	IV. 266
Time devoted to meals	IV. 268
Tea and coffee	IV. 270
Excessive use of water	IV. 272
Cost of labor as influencing food	IV. 273
Hospitals	V. 24, 313
Death of Dr. Derby	VI. 2
Remarks of Dr. Bowditch	VI. 3
Allusion to Dr. Derby	VI. 27

Development:—

Periods of physical development	V. 337
---	--------

Diphtheria:—

Diphtheria in Massachusetts	VII. 528; VIII. 458
Laws of the disease	VII. 524
Localities described	VII. 517
Conclusions	VII. 533
Deposits of night-soil as a factor	VIII. 197
Circular	IX. xxx
Diphtheria and drainage	IX. xvi, 38

Disease:—

The prevention of disease	I. 42
Mortality from consumption in Massachusetts	I. 47
Prevention of typhoid fever	I. 44
Small-pox in Massachusetts	II. 6; III. 9, 297; IV. 2, 468; V. 2
Small-pox in Ireland	II. 7
Trichina disease in Massachusetts	II. 8, 44
Charbon, or malignant vesicle, in Massachusetts	II. 9, 85
Typhoid fever in Massachusetts	II. 9; VII. 413
The causes of typhoid fever in Massachusetts	II. 109
Table of deaths of persons above five years of age from typhoid fever in Massachusetts during the years 1859-68	II. 114
Table showing relative mortality for the ten years from typhoid fever in the smaller and larger cities and towns	II. 118
Table of deaths from typhoid and typhus fever in Boston 1846-67	II. 125
Table of deaths from typhoid fever in Boston compared with a fixed number of the living in each year	II. 126

Disease — *Continued.*

Shaker communities	II. 161
Dr. Nathan Smith on typhoid fever	II. 163
Dr. James Jackson on typhoid fever	II. 174
Charbon in Massachusetts	II. 9, 85
Symptoms	II. 87
Symptoms in animals	II. 89
Of the morbid changes in the tissues and internal organs	II. 90
Theoretical conclusions as to the nature of the morbid poison, or contagium, in charbon	II. 91
Methods and sources of infection	II. 97
Observations on the epidemic at Walpole	II. 99
On the value and application of disinfectants or antiseptics	II. 104
Slaughtering, bone-boiling, and fat-melting	III. 5
Milddam and water obstructions	III. 6
Vegetable parasites and the diseases caused by their growth upon man	III. 9, 247
Records of sickness	III. 12
Cases of poisoning by arsenic	III. 40
Periodic fevers in and about New Haven, Conn.	III. 64
Circular on vaccination	III. 299
Diseases of infancy and childhood	IV. 204
Insanity not an identity	III. 144
Insane to be separated from causes of the disease	III. 144
Self-limited mental diseases	III. 149
Correspondence on some of the causes of consumption	IV. 14, 310
Asiatic cholera	V. 4
Cerebro-spinal meningitis in Massachusetts	V. 24, 261
Causes of disease among farmers	V. 196
Their prevailing diseases	V. 200
Prevention of disease	V. 455
Restriction of disease	V. 480
Influenza	V. 533
Typhoid investigation in Medford	V. 526
Registration of disease. (<i>See</i> Registration)	VI. 21; VIII. 12, 264
Parasites of animals	VI. 142
Parasites affecting sheep	VI. 157
Chronic diseases of animals	VI. 158
Acute diseases of animals	VI. 158
Pleuro-pneumonia	VI. 159
Hoof and mouth disease	VI. 159
Rinderpest	VI. 160
Anthrax	VI. 161
Texas cattle disease	VI. 163
Milk-sickness	VI. 165
Hog-cholera	VI. 165
Glanders	VI. 165

Disease — *Continued.*

Tape-worm	VI. 142
Trichina spiralis	VI. 151
Diphtheria in cities and towns of Massachusetts	VII. 534
Prevalent diseases of the various health districts for the year 1875:—	
Berkshire	VII. 487
Connecticut Valley	VII. 487
Metropolitan	VII. 489
Midland (Worcester County)	VII. 488
North-eastern	VII. 489
South-eastern	VII. 490
Wave-like progress of contagious diseases	VII. 490
Intestinal disorder due to impure ice	VII. 14, 465
Registration of prevalent diseases	VII. 14
Disease in a house under unsanitary conditions	VII. 417
Diphtheria in Massachusetts towns	VII. 528
Disease of the mind	VIII. 13, 325
Sources of disease	VIII. 114
Fever at Fort Cumberland	VIII. 120
Fever at Uppingham School	VIII. 120
Fever from watered (?) milk	VIII. 122
Enteric fever at Lausen	VIII. 124
Yellow fever and filth	VIII. 127
Dysentery and fever from filth	VIII. 128
Prevention of filth diseases	VIII. 129
Syphilis	X. xxvii
Yellow fever epidemic	X. xxix
Prevalent diseases	X. 282; IX. xxxvi; XI. 13
Prevalent diseases, and causes of disease	XI. 13
Circular	XI. 16
Contagious diseases at schools	IX. 243
Rules for preventing the spread of contagion in schools	IX. 252
Scarlet fever	IX. xxvi, 253
Order of succession of ten principal diseases, 1870-75	IX. 262
Scarlet fever a disease of the young	IX. 268
Prevailing diseases in Lynn	VIII. 209
Scarlet fever	IX. xxvi, xxxii
Hydrophobia	IX. xxviii
Diphtheria	IX. xxx
Circular on scarlet fever	IX. xxxii
Diphtheria and drainage	IX. xvi. 38
Relative mortality from consumption in the towns of the Housatonic Basin	
.	IX. 23
Filth diseases and defective drainage	X. 106
Diseases in towns. <i>See</i> "Towns."	
Disinfection:—	
Disinfectants in charbon	II. 104

Disinfection — *Continued.*

Disinfecting power of earth	I. 54
Disinfectants and deodorants	IX. 302
Difficulties in complete disinfection	IX. 311
Disinfecting establishments in Liverpool	IX. 317
Directions for using disinfectants	X. 305
Disinfection	XI. 19

Dix, D. L.:—

Miss Dix's work in establishing insane asylums	VIII. 347
--	-----------

Dole, John:—

Food of the people	IV. 257
------------------------------	---------

Dollfus-Galline, C.:—

Blood-albumen, its value and mode of production	I. 33
---	-------

Drainage:—

Drains imperfectly trapped	I. 53
Drainage of slaughter-houses	I. 23
Drainage of towns in England	I. 46
Drainage in Concord	II. 64
Drainage for health	IV. 13, 175
Ventilation of house-drains	IV. 26, 461
Sewers	IV. 36
Drainage of building-sites	IV. 178
Cellars	IV. 182
What makes the water bad?	IV. 187
Sink-drains	IV. 189
Farmhouse kitchen-drains	V. 254
Drains and privies neglected	V. 232
Drains and sewers	V. 453; VI. 5; VII. 150
Defects in house-drainage, and their remedies	VII. 13, 423
Surface-drainage of the metropolitan district	VII. 15
The water-supply, drainage, and sewerage of the State, from a sanitary point of view	VII. 175
Excrement removal	VII. 180
Water-supply and sewerage	VII. 193
Outlets of sewers	VII. 202
Lists of cities and towns showing disposition of sewage	VII. 202
Is such sewage offensive?	VII. 205
Covered stream used as a sewer in Wakefield	VII. 221
Proctor's Brook in Peabody	VII. 224
Sewers in Chicopee	VII. 226
Sewage of one town polluting air or water of another	VII. 228
Water-supply and sewerage of Boston	VII. 232
Water-supply and sewerage of Chicopee	VII. 246
Sewerage of Fall River	VII. 247
Haverhill	VII. 248
Lynn	VII. 249
Salem	VII. 257

Drainage — *Continued.*

Water-supply and sewerage of Worcester	VII. 264
Drains between the houses and sewer or other receptacle . . .	VII. 426
Drains within the house-walls	VII. 435
English method of waste-pipes	VII. 440
Duties of architects	VII. 462
Duties of proprietors and occupants	VII. 464
Record of drains needed	VII. 464
Surface-drainage of the metropolitan district	VII. 15, 507
House-drainage	VIII. 160
Drainage in Lynn	VIII. 192
Drainage, sewerage, and the pollution of streams	IX. xv, 1
Diphtheria and drainage	IX. xvi, 38
Common defects in house-drains	X. xlii, 85
Circular	X. 300
Causes of leaking	X. 96
Brick more liable to break than cement or iron	X. 97
Defects of cement and earthenware	X. 95, 105
Instances of choked and defective drains	X. 88
Efficient essential conditions of drains	X. 87
Form	X. 91
Inclination or pitch	X. 93
Size	X. 89
Smoothness	X. 92
Tightness	X. 94
Height at connection with sewer	X. 102
Hole into sewer smaller than drain	X. 103
Non-existence and semi-existence	X. 88
More liable to occur in brick than in cement or iron drains .	X. 97
Sickness	X. 96, 98
Materials	X. 92, 104
Durability	X. 104
Mode of connecting with sewers	X. 100
Regulations in Boston	X. 103
Pitching the wrong way	X. 93
Want of tightness the common defect	X. 95
Detection of leaks by peppermint	X. 99, 107
House-drainage	XI. 25
Akron drain-pipes	X. 105
Cement	X. 105
Clay	X. 105
Iron	X. 106
Slip-glazed pottery	X. 105
Wood	X. 105
Remedy for defective drainage	X. 107
Improper drainage	X. 280, 281, 292
Plans of drains required in Frankfort. (<i>See also "Sewerage"</i>) .	X. 108

Drake, L. S.:—

Iron-works at Easton, on Taunton River VII. 137

Draper, F. W.:—

Analysis of the mortality of Boston in 1870 II. 354

Health of minors employed in manufactories of cotton, woollen,
silk, flax, and jute II. 16, 409

Abstract of manufacturers' replies II. 412

Table showing comparative mortality among minors in the State
of Massachusetts at large, and those employed in mills II. 420

Arsenic in certain green colors III. 6, 17

Arsenic as a pigment III. 19, 29

In artificial flowers III. 21

In dresses III. 25

In confectionery and toys III. 26

In paper III. 30, 33

Signs of arsenical poisoning III. 47

Methods of poisoning III. 48

Susceptibility to poisoning III. 51

Effect of arsenic on workmen III. 22, 53

Tests for arsenic III. 20

Case related by Dr. James Whitehead III. 40

Dr. W. E. Rice III. 41

Dr. John Jeffries III. 43

Reference to cases III. 46

Professor Taylor's examination of arsenic-bearing dust III. 50

Visit to manufactories of wall-paper III. 53

The homes of the poor in our cities IV. 15, 395

Boston IV. 396

Fall River IV. 401

Lawrence IV. 405

Lowell IV. 408

Lynn IV. 410

Salem IV. 414

Springfield IV. 419

Worcester IV. 423

Crystal Palace, or Lincoln Building, Boston IV. 432

Act for protection of public health IV. 434

Health ordinance of Boston IV. 437

Small-pox in Spencer V. 542

Appointment as temporary secretary of the Board VI. 4

Registration of prevalent diseases VI. 21; VII. 14, 475; VIII. 269

Circular VII. 482

Dresden:—

Experiments on the ground atmosphere VI. 209, 210, 212

Drinking-water:—

Drinking-water should not be drawn from tanks VII. 441

Drugs:—

Efficacy of drugs compared with preventive measures	V. 34
Drugs	V. 475

Drunkards:—

Drunkenness now and formerly	VI. 28
Sentimental regard for the drunkard	VI. 29
Treatment of the drunkard	VI. 29
Definition and treatment of the drunkard	VI. 31
Drunkards ought to be deprived of civil rights	VI. 32
Drunkards, what shall we do with them?	III. 109

Dry-earth system:—

Dry-earth system	IV. 22; VIII. 87
Cost of dry removal	VIII. 101

Dunbar, G. H.:—

School sessions	V. 423
---------------------------	--------

Durand-Claye, Alfred:—

Disposal of sewage	VIII. 109
------------------------------	-----------

Dust:—

Microscopic examination of dust	II. 406
Professor Taylor's examination of arsenic-bearing dust	III. 50

Dysentery:—

Dysentery and fever from filth	VIII. 128
--	-----------

Ear:—

Parasitic disease of the ear	III. 274, 295
--	---------------

Earth:—

Disinfecting power of earth	I. 54
---------------------------------------	-------

Earth-closet:—

Earth-closets	I. 5; II. 233, 235; VII. 300; VIII. 129; X. 301
The dry-earth system	IV. 22

East Boston:—

Mortality rate from 1870 to 1874	VI. 335
--	---------

Edgartown:—

Board of Health of Edgartown	XI. 34
--	--------

Education:—

Education of persons of consumptive tendencies	V. 50
--	-------

Engineer:—

Engineer for the State recommended	VIII. 7
--	---------

England:—

Drainage of towns in England	I. 46
Carbonic acid found in the open air in England	II. 405
Summary of English laws in regard to common lodging-houses	II. 243
Breton Farm	II. 240; VII. 360, 370, 371
Bedford Irrigation Farm	VII. 379
Durham-county Insane Asylum	VII. 395
Composition of English sewage	IV. 43
River Irwell	IV. 94

England — *Continued.*

River Tweed	IV. 95
Condition of certain English rivers	IV. 91
Case of Bradford	IV. 92
Rivers Pollution Commission	VII. 400
Experience of sewage in England	VII. 285
The sewage question in England	VII. 289
Result of three years' experiments at the sewage-farm in Rugby,	VII. 337
Irrigation in England	VII. 347; VIII. 81
Pollution of streams in England	VIII. 73
An Act for making further provision for the prevention of pollution of rivers in England	VIII. 73
English Government statistics on sewage	VIII. 90
Conclusions of English Government Board	VIII. 102
English progress in care of insane, and Conolly	VIII. 337
Conolly's work	VIII. 339
Tue-Brook Villa	VIII. 376
Rainhill	VIII. 373-375
West Riding Asylum	VIII. 377
English experience in relation to pollution of streams	IX. 67
Conference on health and the sewage of towns in England	IX. 69
Escapes: —	
Escapes from insane asylums	VIII. 394
Esquirol: —	
Advances in knowledge of insanity	VIII. 334
Examiners, Medical: —	
Law appointing medical examiners	X. xxxvi
Excavations: —	
Excavations in clay lands	V. 5
Excrement: —	
Excrement removal	IV. 34; VII. 180
Ash-closets	VII. 186, 301
Hull privy	VII. 182
Improved privy	VII. 185
Manchester pail-closet and dry-earth system described	VII. 183
Methods in use in Great Britain	VII. 181
Goux system	VII. 301
Points to be considered in construction of privies	VII. 181
Method of emptying receptacle-vaults	VII. 188
Exercise: —	
Exercise by persons of consumptive tendencies	V. 52
Walking	V. 53
Running	V. 55
Dancing	V. 55
Horseback exercise	V. 56
Driving	V. 57
Gymnastics	V. 57

Exercise — *Continued.*

Boxing	V. 57
Bowling	V. 58
Rowing	V. 58
Swimming	V. 58

Expenses:—

Expenses of the Board, I. 6, 58; II. 17, 18; III. 13, 15; IV. 18; V. 28; VI. 23; VII. 19, 20; VIII. 17; IX. xxxix; X. xlvii; XI. 42.

Eye:—

Eyesight of school-children	V. 404
---------------------------------------	--------

Factory:—

Health of factory operatives	II. 16, 410
Factory villages	V. 371

Fall River:—

Homes of the poor	IV. 401
Sewerage of Fall River	VII. 247

Farmers:—

Health of the farmers of Massachusetts	V. 24, 181
Social condition and prosperity	V. 185
Nativity of our farmers	V. 185
Value of farming-land in Massachusetts	V. 186
Longevity	V. 190
General health	V. 195
Causes of diseases	V. 196
Prevailing diseases	V. 200
The farmer's work	V. 202
Mental influences	V. 242
Work of the wives and children of farmers	V. 209, 256
The farmer's diet	V. 214
Farmhouses	V. 249
Are farmers intemperate? :	V. 221
Location of farmhouses	V. 223
Influence of a damp location upon consumption	V. 227
Cleanliness of surroundings	V. 231
Decaying vegetables in cellars	V. 236
Proximity to barnyards	V. 237
Drinking-water	V. 238
Sleeping-apartments	V. 240
Need of recreation	V. 245

Faroe Islands:—

Measles in the Faroe Islands	I. 49
--	-------

Farr:—

Address of Dr. Farr on State medicine	I. 10
---	-------

Fat-melting:—

Fat-melting and bone-boiling	I. 26
Slaughtering, bone-boiling, and fat-melting	III. 5, 223

Fat-melting — *Continued.*

Act to incorporate the Butchers' Slaughtering and Melting Association	III. 227
Act concerning slaughter-houses and noxious and offensive trades	III. 229
Butchers accept Act to incorporate the association	III. 240
Faucon, E. H.:—	
Intoxicating drinks	III. 126
Favus:—	
Favus	III. 253, 277
Feather-beds:—	
Feather-beds	V. 254
Fever:—	
Intermittent fever in Massachusetts	III. 62
Periodic fevers in and around New Haven, Conn.	III. 64
Fevers of a remittent type in Springfield	IV. 462
Fever from watered (?) milk	VIII. 122
Filtering:—	
Filter-dams at Lake Cochituate	V. 114
Filtering-gallery at Lowell	V. 132, 139
Filter-basin at Waltham	V. 143
Intermittent filtration	V. 129
Filtration of potable water	IX. xxiv, 137
American filter-beds:—	
Agawam River	IX. 151
Columbus and Toledo, O.	IX. 151
Hudson, N.Y.	IX. 149
Poughkeepsie, N.Y.	IX. 146
Other localities	IX. 151
Construction, management, etc.	IX. 143
Filtration of potable water:—	
Generally used in Europe	IX. 141
In United States	IX. 142
Bibliography	IX. 224
Clark's process for softening hard water	IX. 140
Qualifications of good water	IX. 139
Experiments at Springfield	IX. 169
Filter-basins, Taunton	IX. 200
Construction	IX. 143
Household filtration	IX. 206, 216
Filters:—	
Charcoal	IX. 209
Classes of filters	IX. 207
Dimensions	IX. 217
Materials	IX. 206
Silicated carbon	IX. 216
Soft brick	IX. 218

Filters — *Continued.*

Spongy iron IX. 213

Natural filtration:—

Collecting pipes IX. 179

Conclusions IX. 203

Decatur, Ill. IX. 181

Lowell IX. 191

Toulouse, France IX. 182, 190

Waltham IX. 191

Westfield IX. 180

Ground water:—

Character and source of ground water IX. 176, 182

Well at Brooklyn, N.Y. IX. 176, 184

Open basins IX. 182

Tunnels, or filtering-galleries IX. 178

On a large scale:—

A mechanical process IX. 153

Floating matter IX. 155

Suspended matter in ponds IX. 155

Turbidity from clay in suspension IX. 154

Vegetable growths in water IX. 155

Filth:—

The effect of filth on health VII. 278; VIII. 118; X. 106

Filtration:—

Filtration system of treating sewage . . . VII. 324; VIII. 91, 97

Fish:—

Experiments upon fish with poisoned water VII. 70

Results of experiments restated VII. 72

Fisher, T. W.:—

Ventilation of railroad-cars VI. 20, 225

Experiments by W. R. Nichols VI. 229

Gen. Morin on heating and ventilation VI. 237

Methods of heating and ventilating cars VI. 238

Flavoring:—

Character of substances used for flavoring articles of food and

drink IV. 12, 145

Essential oil of bitter almonds IV. 146, 148

Nitro-benzole, or oil of mirbane IV. 157

Artificial fruit-essences IV. 158

Fruit-jellies IV. 164

Artificial essences in alcoholic liquors IV. 166

Tartaric acid as a substitute for fruit IV. 169

Spontaneous change in the extract or essence of vanilla . . IV. 172

Fleck:—

Examination of well-water from Dresden cemeteries . . VI. 281

Folsom, C. F.:—

Our meat-supply and public health VI. 19, 133

Folsom, C. F. — *Continued.*

Putrid meat	VI. 137
Parasites	VI. 142
Precautions	VI. 155
Parasites affecting sheep	VI. 157
Chronic diseases of animals	VI. 158
Acute diseases of animals	VI. 158
Pleuro-pneumonia	VI. 159
Hoof and mouth disease	VI. 159
Rinderpest	VI. 160
Anthrax	VI. 161
Texas cattle disease	VI. 163
Milk-sickness	VI. 165
Hog-cholera	VI. 165
Glanders	VI. 165
Diseased meat in general	VI. 166
Tests of diseased meat	VI. 167
Severely bruised meat.	VI. 168
Effects of starving	VI. 168
Meat from very young animals	VI. 168
Salted or pickled meat	VI. 169
Bad meat easily sold	VI. 169
Effects of terror	VI. 169
Effects of exhaustion	VI. 173
Effects of articles of food	VI. 174
Amount of meat condemned	VI. 175
Standard for condemned meat	VI. 176
Remedies, inspection	VI. 178
Rules for the management of slaughter-houses	VI. 180
Slaughtering-mask	VI. 181
Advantages of inspection	VI. 183
Disposal of sewage	VII. 276
Effect of filth on health	VII. 278
Influence of sewer-gases on health	VII. 281
Water contaminated by sewage	VII. 283
Experience in England	VII. 285
Sewage question in England	VII. 289
Substitutes for the water-carriage system	VII. 299
Moule's dry-earth closet	VII. 300
Charcoal-closet	VII. 300
Goux system	VII. 301
Ash-closets.	VII. 301
Experience in France	VII. 302
Germany	VII. 307
Holland	VII. 311
Adam Scott on the Liernur system	VII. 313
D. W. Hoop on the Liernur system	VII. 317

Folsom, C. F. — *Continued.*

V. de Brannenden on the Liernur system	VII. 318
J. W. Schaap on the Liernur system	VII. 319
Experience in other countries	VII. 322
Processes for purifying sewage	VII. 323
Deodorization	VIII. 323
Filtration	VII. 324
Intermittent downward filtration	VII. 325
Precipitation	VII. 326
Lime process	VII. 328
Alumina processes	VII. 330
Superphosphate process	VII. 331
Sulphite of lime and magnesia process	VII. 331
A B C process	VII. 331
Precipitation by metallic salts	VII. 332
Suvern's system	VII. 332
Lenk's process	VII. 333
Irrigation	VII. 334
Subsoil irrigation	VII. 334
Surface irrigation	VII. 335
Result of three years' experiments at the sewage-farm in	
Rugby	VII. 337
Mode of distributing sewage	VII. 340
Location of sewage-farms	VII. 341
Amount of land necessary	VII. 342
Effect of climate	VII. 342
Theory of the purification of sewage	VII. 343
Effluent from sewage-farms	VII. 343
Alleged ill effects	VII. 344
Cost of irrigation	VII. 345
Methods of disposing of sewage	VII. 347
Manchester, Eng.	VII. 347
Leeds	VII. 348
Birmingham	VII. 349
Coventry	VII. 352
Edinburgh	VII. 354
West Derby	VII. 356
Crewe	VII. 357
Romford	VII. 357
Croydon	VII. 358
Breton Sewage Farm	VII. 360, 370, 371
Bedford	VII. 378
Accounts of Bedford Irrigation Farm	VII. 379
Tunbridge Wells	VII. 383
Leamington	VII. 385
Merthyr Tydfil, Wales	VII. 387
Analyses by Edward Frankland	VII. 38

Folsom, C. F., Methods of disposing of sewage — *Continued.*

Gennevilliers, France	VII. 390
Dantzic, Germany	VII. 393
Durham-county Insane Asylum, England	VII. 395
Augusta, Me.	VII. 395
Waste of sewage	VII. 396
Conditions of sewage-farming	VII. 399
General rules of Rivers Pollution Commission, England	VII. 400
Summary and recommendations	VII. 402
Pollution of streams, disposal of sewage, etc.	VIII. 6, 19, 407
Nashua-river Basin	VIII. 21
Circular	VIII. 22
Population of towns in Nashua Basin	VIII. 23
Statistics of Nashua River	VIII. 25
Summary of statistics	VIII. 34
Pollution from mills	VIII. 35
E. K. Clark's account of Nashua River	VIII. 38
Summary of survey	VIII. 46
Analysis of waters	VIII. 48, 52, 56
Purification of polluted streams	VIII. 59
Pollution of the Nashua	VIII. 61
Some pollution unavoidable	VIII. 62
Testimony of Robert Rawlinson	VIII. 62
Disposal of sewage in the Nashua Basin	VIII. 64
Sewage clarification at Walpole	VIII. 65
Propriety of legislation	VIII. 65
Nashua River beyond the State line	VIII. 67
Pollution of the Merrimac	VIII. 68
Merrimac and other waters	VIII. 70
Effect of farming percolation, etc.	VIII. 71
Legislation in England	VIII. 73
An Act for making further provision for the prevention of pollution of rivers in England	VIII. 73
Disposal of sewage	VIII. 80
Irrigation	VIII. 80
Experiments in Massachusetts	VIII. 80
Progress elsewhere	VIII. 81
Glasgow	VIII. 81
Liernur system	VIII. 82
Precipitating processes	VIII. 82
Coventry	VIII. 82
Leeds	VIII. 83, 84
Examination of effluent water of the A B C precipitating process at Leeds	VIII. 83
Hille's process	VIII. 83
Dry removal	VIII. 87
Opinions of experts	VIII. 88

Folsom, C. F. — *Continued.*

English Government statistics	VIII. 90
Overflow of sewage on land	VIII. 90
Filtration	VIII. 91
Simple subsidence	VIII. 91
Subsidence and filtration	VIII. 92
Irrigation	VIII. 92
Intermittent downward filtration	VIII. 95
Precipitation	VIII. 95
Precipitation and filtration	VIII. 97
Cost of precipitation	VIII. 97
Irrigation	VIII. 98
Barking Farm	VIII. 99
Cheltenham Farm	VIII. 99
Bedford Farm	VIII. 101
Dry removal	VIII. 101
No removal of sewage	VIII. 102
Conclusions of English Government Board	VIII. 102
Experience in Germany	VIII. 104
Austria	VIII. 105
France	VIII. 105
Objections to irrigation below Paris	VIII. 105
Sewage of Paris	VIII. 106
Irrigation with the sewage of Paris	VIII. 106
Intercepting-sewer and deep-sea outlet	VIII. 107
Precipitation	VIII. 107
Present condition, objections, etc.	VIII. 108
Letter from Alfred Durand-Claye	VIII. 109
Some objections to sewage irrigation considered	VIII. 112
Effects on health of bad drainage	VIII. 113
Sources of disease	VIII. 114
Contaminated water	VIII. 114
Opinion of Alfred Carpenter	VIII. 114
The purist theory	VIII. 115
Contaminated air and soil	VIII. 116
Oxidation of sewage	VIII. 117
Filth not safe	VIII. 118
Specific poison theory	VIII. 118
Illustrations from poisoned air	VIII. 118
Croydon	VIII. 119
Fever at Fort Cumberland	VIII. 120
Fever at Uppingham School	VIII. 120
Composition of sewer-gas	VIII. 121
Polluted water	VIII. 122
Fever from watered (?) milk	VIII. 122
Enteric fever at Lausen	VIII. 124
Yellow fever and filth	VIII. 127

Folsom, C. F. — *Continued.*

Dysentery and fever from filth	VIII. 123
Earth-closets	VIII. 129
Prevention of filth diseases	VIII. 129
Frankfort-on-the-Main, sewerage regulations	VIII. 130
Registration of deaths and of diseases	VIII. 12, 231
Circular	VIII. 233
Information from physicians	VIII. 234
Information from town and city clerks	VIII. 248
History of registration of deaths	VIII. 258
Faults in our law	VIII. 261
Importance of registration	VIII. 264
Registration of diseases	VIII. 264
Holland	VIII. 266
Germany	VIII. 267
United States	VIII. 268
Disease of the mind	VIII. 13, 325
Early treatment of the insane	VIII. 327
Pinel's reform and European progress	VIII. 332
France	VIII. 332
Germany	VIII. 334
English progress and Conolly	VIII. 337
Conolly's work	VIII. 339
American progress	VIII. 341
Period of American leadership	VIII. 347
American principles of treatment	VIII. 350
Later progress	VIII. 353
Present condition	VIII. 356
The twenty-years' leadership	VIII. 358
Modern methods of less restraint	VIII. 358
Opinions and letters	VIII. 361
Dr. J. C. Bucknill	VIII. 361
Dr. Batty Tuke and Dr. John Fraser	VIII. 362
Dr. T. S. Clouston	VIII. 368
Sir James Cox	VIII. 371
Dr. T. L. Rogers	VIII. 373, 375
Tue-Brook Villa	VIII. 376
West Riding Asylum	VIII. 377
Westphal	VIII. 379
Munich	VIII. 380
H. G. Stearns	VIII. 382
Andrew McFarland	VIII. 382
Less-restraint methods considered	VIII. 382
Management and curability	VIII. 384
A. M. Shew	VIII. 385
Position of English and European experts	VIII. 386
Edgar Sheppard	VIII. 386, 388

Folsom, C. F. — *Continued.*

Dr. Yellowlees	VIII. 387
Substitutes for restraint	VIII. 390
Accidents considered	VIII. 390
James Wilkes on fatal accidents in insane asylums	VIII. 292
Question of escapes	VIII. 394
Summary of restraint question	VIII. 394
Responsibility for crime, and definitions of insanity	VIII. 397
Massachusetts statistics and asylum accommodation	VIII. 401
Mark Ranney on accommodation for insane	VIII. 405
Andrew McFarland, insane in Illinois	VIII. 405
Supervision by the State	VIII. 406
Committal to asylums	VIII. 406
Improper committals	VIII. 407
More or better supervision needed.	VIII. 408
Uses of a commission	VIII. 408
False position of American Association	VIII. 409
Complaints of discharged patients	VIII. 410
Best supervision	VIII. 411
Good asylums, as a rule, better than homes	VIII. 413
Project of a law	VIII. 414
J. C. Bucknill on supervision of insane	VIII. 417
Certain asylum needs	VIII. 421
Education in hygiene	VIII. 421
Better hospitals and trained nurses	VIII. 423
Medical education	VIII. 426
New York law concerning committal of insane	VIII. 427
Summary	VIII. 430
Drainage and health, sewerage, and the pollution of streams	IX. xv, 1
Circular	IX. 3
Hoosac and Housatonic Rivers	IX. 3
Area and population	IX. 7
Water-supply and sewerage	IX. 8
Pollution in the county	IX. 9
Housatonic basin	IX. 9
Notes of E. K. Clark	IX. 9
Mills, factories, etc., in the Housatonic Basin	IX. 14
Summary of statistics for certain points on the Housatonic	
River	IX. 19
General survey	IX. 20
Natural drainage	IX. 21
Relative mortality from consumption in the towns of the Housa-	
tonic Basin	IX. 23
Analysis of water from Pittsfield and Lee	IX. 25
Hoosac Basin	IX. 28
Notes of E. K. Clark	IX. 28
Statistics of the Hoosac Basin	IX. 32

Folsom, C. F. — *Continued.*

Examination of water from Hoosac River	IX. 36
Natural drainage	IX. 38
Diphtheria and drainage	IX. 38
Williamstown	IX. 40
Examination of well-waters in Williamstown	IX. 44
South Adams	IX. 46
North Adams	IX. 47
Examination of water from North Adams	IX. 51
Circular	IX. 55
Replies from manufacturers	IX. 56
Summary and draft of a law	IX. 66
English experience	IX. 67
Conference on health and the sewage of towns in London	IX. 69
France	IX. 70
Germany	IX. 70
Massachusetts	IX. 71
A bill to prevent the pollution of streams, and for other purposes,	IX. 73
Recommendations	IX. 77
Necessity of supervision	IX. 80

Folsom, C. W. :—

The surface-drainage of the metropolitan district	VII. 15, 507
Areas of upland and lowland for Boston and neighboring towns,	VII. 512

Food :—

The adulterations and impurities of food	III. 6, 131; IV. 15, 390
On the action of acid fruits upon tin cans	III. 132
Adulteration and impurities of vinegar	III. 134
Adulteration of coffee	III. 136
Character of substances used for flavoring articles of food and drink	IV. 12, 145
The food of the people	IV. 13, 235
Food and cookery	V. 375
Food and drink of persons disposed to consumption	V. 41
Purposes of food	V. 378
Diet table of Massachusetts State Prison	VI. 374
Of prisons in Great Britain	VI. 375
Substances used for flavoring food and drink	IV. 12, 146
Adulteration of food	III. 7, 132; IV. 15, 390
Food of the people of Massachusetts	IV. 13, 235
Circular	IV. 241
Letter from Dr. John Dole	IV. 257
Bread	IV. 261
Variety in food	IV. 263
Frying of meat	IV. 265
Pastry and cakes	IV. 266
Time devoted to meals	IV. 268
Tea and coffee	IV. 270

Food — *Continued*.

Excessive use of water	IV. 272
Cost of labor as influencing food	IV. 273
Tartaric acid as a substitute for fruit	IV. 169
Food and nutrition of children	IV. 206
Distillery milk	IV. 209
Adulteration of milk	IV. 14, 277
Confectionery	III. 26; IV. 390
Pickles	IV. 393
Extracts of meat	IV. 271
Necessity of animal food	VI. 136
The farmer's diet	V. 214
Food	V. 475
Pork as an article of diet	V. 219
Pork-packing in the East and West	V. 17

Foot and mouth disease in cattle:—

The foot and mouth disease in cattle; its effect on man	II. 4
Report on the use of milk from cows affected with "foot and mouth disease"	II. 4, 425
Inoculation with "foot and mouth disease"	II. 430
Conclusions	II. 432

Forbes, D.:—

Process of treating sewage	IV. 51
--------------------------------------	--------

Foundlings:—

Foundlings and abandoned children	IV. 221
---	---------

France:—

Sewerage in France	VII. 302; VIII. 105; IX. 70
Irrigation of land	VIII. 105
Care of insane in France	VIII. 332

Frankfort-on-the-Main:—

Sewerage regulations of Frankfort-on-the-Main	VIII. 130
House-drainage and sewerage	X. 108

Fraser, John:—

Care of the insane	VIII. 362
------------------------------	-----------

French, H. F.:—

Drainage for health	IV. 13, 175
Building-sites	IV. 178
Cellars	IV. 182
What makes the water bad?	IV. 187
Sink-drains	IV. 189

Fresh Pond:—

Drainage into Fresh Pond	X. 216
Analysis of Fresh-pond water	IX. 344

Fruit:—

Artificial fruit-essences	IV. 147, 158, 161
Action of acid fruits upon tin cans	III. 132
Fruit-jellies	IV. 164

Fruit — *Continued.*

Tartaric acid as a substitute for fruit IV. 169

Fuller, F. L. :—

Notes on Taunton River VII. 136

Galton, Capt. :—

Hospitals V. 327

Galvanized iron :—

Galvanized iron for conveyance of drinking-water . . . V. 26, 487

Gas :—

Pollution of streams by gas-works VIII. 38

Gas in sleeping-rooms V. 179

Coal-gas from heating-apparatus X. xlii

Gathering-grounds:—

Gathering-grounds for water-supply VII. 201

Gay, G. W. :—

Results of treatment in new wards of Boston City Hospital . X. 247

Germany :—

Sewerage in Germany VII. 307; VIII. 104; IX. 70

Irrigation of land VIII. 104

Registration of deaths and of diseases VIII. 267

Care of insane in Germany VIII. 334

Gheel :—

Gheel principle of treating the insane . . . VIII. 328, 334, 430; X. 15

Glanders:—

Glanders VI. 165

Gloucester :—

Diphtheria in Gloucester IX. 463

Examination of water IX. 475

W. R. Nichols on water IX. 475, 480

Climate IX. 463

Distribution of foreigners by wards IX. 470

Mortality IX. 465, 466, 467, 469, 470

Natural advantages and disadvantages IX. 464

Natural drainage IX. 463

Population IX. 463

Sanitary state of houses IX. 472

Character of soil IX. 46

Topography IX. 463

Water IX. 475-482

Gorini :—

Gorini's method of cremation VI. 256

Goux :—

Goux system VII. 301

Grape :—

Grape-culture in Ohio III. 99

Grape-culture in California III. 99

Grape—*Continued.*

Jefferson, Thomas	III. 96
Phelps, R. H.	III. 97
Adlum, John	III. 97

Green colors:—

Arsenic in certain green colors	III. 6, 17
---	------------

Griesinger:—

Mental disease	VIII. 336
--------------------------	-----------

Ground atmosphere:—

Composition of the air of the ground atmosphere	VI. 20
---	--------

Guinzburg, Rabbi Dr.:—

Influence of Jewish customs on consumption	IV. 379
--	---------

Gymnastic exercises:—

Gymnastic exercises for persons of consumptive tendencies	V. 57
---	-------

Hall, W. S.:—

Hall's treadle for sewing-machines	III. 218
--	----------

Haskins, A. L.:—

Examination of tenement-houses	II. 219
Consumption among the Jews	IV. 380

Haverhill:—

Little River	VII. 248
Sewerage of Haverhill.	VII. 248

Hayes, S. D.:—

The use and abuse of opium	III. 166
--------------------------------------	----------

Health:—

Information on health for the people	I. 5
Laws relating to public health	I. 16
Quality of water	I. 55
Foot and mouth disease in cattle, its effect on man	II. 4, 425
Health of minors employed in manufactories	II. 16, 410
Effects on health of the use of sewing-machines moved by foot-power	III. 8, 179
Revision and codification of health laws	IV. 7
Act for protection of the public health	IV. 434
Health ordinance of Boston	IV. 437
Health of the farmers of Massachusetts	V. 24, 181
Political economy of health	V. 25, 333
Health regulations at Wakefield	IV. 464
Duties of local boards of health	V. 26
Financial view of health	V. 341
Health assurance companies	V. 344
Moral aspects of health	V. 353
Health regulations	V. 453
Value of health to the State	VI. 18, 55
Meat-supply and public health	VI. 19, 133
Sanitary hints	VII. 13, 409

Health — *Continued.*

The effect of filth on health	VII. 278
The influence of sewer-gases on health	VII. 281
Health of Boston, 1875	VII. 493
Health of Lowell	VII. 513
Effects on health of bad drainage	VIII. 113
Drainage and health	IX. 1
The ill effects of school-prives on health	IX. 241
Boards of health, IV. 8, 440; VI. 5; VII. 527; IX. xiv; X. xxxii, 11, 251, 254; XI. 31	
Water-supplies	X. 252
In Massachusetts	X. 254
Health of towns, II. 8, 51; III. 10, 305; IV. 16, 449; V. 26, 511; VI. 21, 327; VII. 16, 525; VIII. 14, 437; IX. xxvii, 377; X. xlv, 249. (<i>See also</i> "Towns.")	

Heating :—

Care of heating-apparatus	I. 52
Heating and ventilation of railroad-cars	VI. 238
An improved method	VI. 239
Record of observations on heating and ventilation at the Boston City Hospital	X. 23
Heating of public schools	IX. 231
Coal-gas from heating-apparatus	X. xlii
Heating-apparatus for persons disposed to consumption	V. 39

Hill, Octavia :—

Organized work among the poor	II. 212
---	---------

Hill, H. B. :—

Examination of air in Cambridge	II. 403
Adulterations and impurities of food	III. 7, 131; IV. 15, 389
Action of acid fruits upon tin cans	III. 132
Adulteration and impurities of vinegar	III. 134
Adulteration of coffee	III. 136
Confectionery	IV. 390
Pickles	IV. 393

Hille :—

Hille's process of treating sewage	VIII. 85
--	----------

Hitchcock, E. :—

The department of physical education and hygiene in Amherst College	X. xli, 63
--	------------

Hoadley, J. C. :—

Transportation of live-stock	VI. 18, 77
Act of Congress to prevent cruelty to animals	VI. 88
Bedding in stock-cars	VI. 97
Letter from John Cummings	VI. 104
Transportation of swine	VI. 107
Transportation of sheep	VI. 109
Transportation of horses	VI. 109

Hoadley, J. C. — *Continued.*

Boston live-stock market	VI. 110
Quality of beef cattle	VI. 118
Stock-yards	VI. 120
Union Stock-yards, Chicago	VI. 121
Buffalo Stock-yard	VI. 126
Albany Stock-yards	VI. 127
Stock-yards at Brighton	VI. 129
Union Stock-yards, Watertown	VI. 130

Hogs:—

Hogs fed on offal	I. 24
Hog-cholera	VI. 165
Transportation of swine	VI. 107
Act concerning swine-slaughtering associations	VI. 200

Holden's process:—

Holden's process of treating sewage	IV. 46
---	--------

Holland:—

Sewerage in Holland	VII. 311
Registration of deaths and of diseases	VIII. 266

Holliston:—

Water-supply, sewerage, etc.	VII. 104
--------------------------------------	----------

Holmgren:—

Color-blindness	IX. 112, 114
---------------------------	--------------

Homes:—

Model lodging-houses and common tenements	I. 4; II. 218
Homes for the people	I. 4; II. 10, 181
Convalescent homes	II. 229
A night stroll with an inspector of the London metropolitan police, and a similar walk in Boston	II. 183
Operations of philanthropists for the improvement of the dwellings of the poor in London	II. 193
The Peabody Buildings	II. 194
Miss Burdett-Coutts's market-house, lodging-house, and reading-room at Columbia Square	II. 199
The Improved Industrial Dwelling Company	II. 201
Jarrow Building Company	II. 210
Organized work among the poor	II. 212
Summary of investigations	II. 217
Homes of the poor in our cities	IV. 15, 395
Boston	IV. 396
Fall River	IV. 401
Lawrence	IV. 405
Lowell	IV. 403
Lynn	IV. 410
Separate homesteads conducive to health	IV. 411
Salem	IV. 414
Springfield	IV. 419

Homes, Houses of the poor in our cities — *Continued.*

Worcester	IV. 423
Crystal Palace, or Lincoln Building	II. 220; IV. 432
Act for protection of public health	IV. 434
Health ordinance of Boston	IV. 437
Hood, F. J. :—	
Intoxicating drinks	III. 123
Hoof and mouth disease :—	
Hoof and mouth disease	VI. 159
Hoop, D. W. :—	
Liernur system	VII. 317
Hoosac River :—	
Hoosac and Housatonic Rivers	IX. 3
Area and population	IX. 7
Water-supply and sewerage	IX. 8
Pollution from mills, etc.	IX. 9, 28-31
Hoosac Basin	IX. 28
Notes of E. K. Clark	IX. 28
Statistics of the Hoosac Basin	IX. 32
Examination of water from Hoosac River	IX. 36
Natural drainage	IX. 38
Horses :—	
Transportation of horses	VI. 109
Epidemic among horses, and the influence of bad hygienic conditions on the prevalence of it	VII. 411
Horseback exercise :—	
Horseback exercise by persons of consumptive tendencies	V. 56
Hospitals :—	
Hospitals for the insane	III. 151
Hospitals	V. 24, 313
Miss Nightingale on hospitals	V. 320
Simpson on hospitalism	V. 320
Bristowe and Holmes	V. 322
Evory Kennedy	V. 323
Paget on air of hospitals	V. 324
American and English hospitals	V. 325
Experience of our civil war	V. 325
Capt. Galton	V. 327
Cottage hospitals	V. 327; IX. xxii, 81
Many-storied hospitals	V. 328
How to build hospitals	V. 329
Advantages of one-storied hospitals	V. 330
Artificial ventilation of hospitals	V. 331
Location of hospitals	V. 332
Details of construction	V. 332
Dr. J. S. Billings	V. 332
Need of more hospitals	V. 315

Hospitals — Continued.

Physicians not builders of hospitals	V. 315
Change of opinion concerning hospitals	V. 316
Communicable diseases in hospitals	V. 317
Hospitals of preceding generations	V. 318
Air of hospitals	V. 320
Inebriate asylums or hospitals	VI. 17, 25, 34
Sites for the asylum	VI. 39
Average cost of patients in hospitals	VI. 64
Average duration of sickness in hospitals	VI. 62
Mortality rate of hospitals	VI. 60
Hospitals in Massachusetts outside of Boston	IX. 85
Hospitals for infectious diseases in Great Britain	IX. 312
Hospitals for infectious diseases needed	IX. 315
Cambridge Hospital	IX. 354
Hospital homes for the insane	X. xl, 3
Ventilation in the Boston City Hospital	X. 231

Housatonic River:—

Hoosac and Housatonic Rivers	IX. 3
Area and population	IX. 7
Water-supply and sewerage	IX. 8
Pollution in the county	IX. 9
Housatonic Basin	IX. 9
Notes of E. K. Clark	IX. 9
Mills, factories, etc., in the Housatonic Basin	IX. 14
Summary of statistics for certain points on the Housatonic River,	IX. 19
Origin of branches	IX. 28, 29
General survey	IX. 20
Natural drainage	IX. 21
Consumption in the towns of the Housatonic Basin	IX. 23
Examination of waters	IX. 24
Soil and strata	IX. 21

Houses:—

Model lodging-houses and common tenements	I. 4
Houses in the country	I. 53
Overcrowding of tenement-houses and want of clean streets in Boston	II. 5
Houses for the people	II. 181
A night stroll with an inspector of the London metropolitan police, and a similar walk in Boston	II. 183
Operations of philanthropists for the improvement of the dwell- ings of the poor in London	II. 193
The Peabody Buildings	II. 194
Miss Burdett-Coutts's market-house, lodging-house, and reading- room at Columbia Square	II. 199
The Improved Industrial Dwelling Company	II. 201
Waterlow Buildings	II. 204

Houses — *Continued.*

Allen's buildings	II. 208
Jarrow Building Company	II. 210
Summary of investigations	II. 217
Model lodging-house and common tenement compared	II. 218
Model lodging-house in Osborn Place, Boston	II. 219
Common tenement-house, or Crystal Palace so called	II. 220
Summary of English laws in regard to common lodging-houses	II. 243
Model lodging and low tenement houses	III. 10
Boston Co-operative Building Association	III. 11
Crystal Palace, or Lincoln Building	III. 11
Typhoid fever in houses newly built	III. 323
House accommodation of the poor in our most populous cities,	IV. 15, 395
Location of farmhouses	V. 223
Cleanliness of surroundings	V. 231
Decaying vegetables in cellars	V. 236
Sleeping-apartments	V. 240
Farmhouses	V. 249
Hudson, N.Y.:—	
Filtering-beds at Hudson, N.Y.	IX. 149
Examination of water from Hudson, N.Y.	IX. 167
Hulbert, C. M.:—	
Typhoid fever in South Dennis	VIII. 494
Hull:—	
The Hull privy	VII. 182
Hurd, Y. G.:—	
Letter concerning crime	III. 117
Hydrographical:—	
Hydrographical survey	VI. 6
Hydrophobia:—	
Hydrophobia	IX. xxviii
Hygiene:—	
Public hygiene	I. 55
School hygiene	V. 25, 391
Ice:—	
Ice-supply of Pittsfield	VII. 274
Intestinal disorder due to impure ice	VII. 14, 465
Impure ice	X. xl, 119, 120, 161, 163
Improved:—	
The Improved Industrial Dwelling Company	II. 201
Indexes:—	
Indexes, I. v; II. vii; III. vii; IV. vii; V. vii; VI. vii; VII. vii;	
VIII. vii; IX. 505; X. 300	
General Index	XI. 43
Inebriate:—	
Inebriate asylums	III. 7, 109; VI. 17, 25, 34

Inebriate — *Continued.*

Drunkenness now and formerly	VI. 28
Sentimental regard for the drunkard	VI. 29
Treatment of the drunkard by the law	VI. 29
No systematic effort hitherto made to cure the drunkard as one diseased	VI. 30
Drunkards ought to be deprived of civil rights	VI. 32
Asylums in other States	VI. 35
Classification of drunkards in asylums	VI. 36
Sites for asylums	VI. 39
Employment of the inmates	VI. 39
Workshops	VI. 40
Amusements	VI. 40
Superintendent	VI. 41
Attendants	VI. 42
Religious instruction and worship	VI. 42
Penal asylums	VI. 43
Asylum accommodations for women	VI. 43
Reports	VI. 43
Intemperance as a cause of pauperism	VI. 45

Infants:—

Infant mortality	IV. 13
----------------------------	--------

Influenza:—

Influenza	III. 313; V. 533
---------------------	------------------

Information:—

Information on health for the people	I. 5
--	------

Ingalls, P. P.:—

Communication to board of aldermen of consulting-physicians of Boston	II. 56
--	--------

Insane:—

Proper provision for the insane	III. 7, 139
Insanity not an identity	III. 144
Insane to be separated from causes of their disease	III. 144
Self-limited mental diseases	III. 149
Hospitals for the insane	III. 151; X. xl, 1
Insanity	V. 382
Insanity among farmers	V. 242
Cost of restoring the insane	V. 384
Burden of insanity in Massachusetts	V. 387
Constant recurrence of insanity	V. 389
Disease of the mind	VIII. 13, 325
Early treatment of the insane	VIII. 327
First known insane asylums	VIII. 328
In England	VIII. 330
Germany	VIII. 334
United States	VIII. 341
Pinel's reform, and European progress	VIII. 332

Insane, Pinel's reform and European progress—*Continued.*

France	VIII. 332
Germany	VIII. 334
Curability	VIII. 335, 360, 369, 383, 403, 427
English progress and Conolly	VIII. 337
Conolly's work	VIII. 337, 339-341, 390
Coleridge's views	VIII. 338
American progress	VIII. 341
Period of American leadership	VIII. 347
American principles of treatment	VIII. 350
Later progress	VIII. 353
Present condition	VIII. 356
The twenty-years' leadership	VIII. 358
Modern methods of less restraint	VIII. 358
Examination by experts	VIII. 359
Opinions and letters	VIII. 361
Dr. Bucknill	VIII. 361, 392, 396, 400, 417-421
Drs. J. B. Tuke and John Fraser	VIII. 362-368, 400
Dr. Clouston	VIII. 368-371, 411, 412
Sir James Coxé	VIII. 371, 373, 414
Lindsay, W. L.	VIII. 359
McDonald, C. F.	VIII. 406
Owen, Harold	VIII. 376, 377
Ranney, Mark	VIII. 405
Reynolds, A.	VIII. 406
Rogers, Dr. T. H.	VIII. 373-376
Tue-Brook Villa	VIII. 376
West Riding Asylum	VIII. 377
Charles Westphal	VIII. 379
Munich	VIII. 380
H. P. Stearns	VIII. 381
Andrew McFarland	VIII. 382
Less-restraint methods considered	VIII. 382
Management and curability	VIII. 384
Position of English and European experts	VIII. 386
Edgar Sheppard	VIII. 386, 388
Dr. Yellowlees	VIII. 387
Substitutes for restraint	VIII. 390
Accidents considered	VIII. 390
James Wilkes on fatal accidents	VIII. 392
Question of escapes	VIII. 394
Summary of restraint question	VIII. 394
Responsibility for crime, and definitions of insanity	VIII. 397
Massachusetts statistics and asylum accommodation	VIII. 401
Ratio of curable cases in asylums growing less	VIII. 403
Mark Ranney on accommodation for insane	VIII. 405
Andrew McFarland on insane in Illinois	VIII. 382, 405

Insane — Continued.

Supervision by the State	VIII. 406
Committal to asylums	VIII. 406
Improper committals	VIII. 407
More or better supervision	VIII. 408
Uses of a commission	VIII. 408
False position of American Association	VIII. 409
Complaints of discharged patients	VIII. 410
Best supervision	VIII. 411
Good asylums, as a rule, better than homes	VIII. 413
Project of a law	VIII. 414
J. C. Bucknill on supervision of insane	VIII. 417
Certain asylum needs	VIII. 421
Education in hygiene	VIII. 421
Better hospitals and trained nurses	VIII. 423
Medical education	VIII. 426
New York law concerning committal of insane	VIII. 427
Summary	VIII. 430
Classification in asylums	X. 12
Complaints of patients	X. 7
Different states of mind in insane	X. 6
Dining together	X. 9
Laboring under acute attack	X. 10
Noisy patients	X. 11
Supervision of insane	X. xxxvii
Asylums for the insane	X. xl, 3
Risk and prevention of accidents	X. 7
Airing courts	X. 3, 8
Amusements	X. 10
Arrangement of wards	X. 13
Female attendants	X. 11
Cottages for married attendants	X. 15
Training of attendants	X. 12
Advances in ideas and treatment of insanity:—	
American leaders after Rust and Wyman	VIII. 349
Bard, Samuel	VIII. 342
Bell, L. V.	VIII. 347, 349-52, 383, 384, 424, 431
Bichat	VIII. 333, 334, 431
Bond	VIII. 341
Browne, J. C.	VIII. 377, 379, 424
Chapin, J. B.	VIII. 353, 354, 425
Conrad	VIII. 346, 384
Cullen	VIII. 330, 333
Dix, D. L.	VIII. 347, 348
Earle, P.	VIII. 329, 343, 349, 353, 355, 426
Esquirol	VIII. 333, 334, 430
Gray, J.	VIII. 354, 426

Insane — Continued.

Greding	VIII. 333
Griesinger	VIII. 335, 336, 341, 389
Guislam	VIII. 389, 390
Heinroth	VIII. 335
Hill, R. G.	VIII. 340
Howe, S. G.	VIII. 349, 406
Hunter, John	VIII. 330, 431
Ideler	VIII. 336
Jacobi	VIII. 335
Jarvis, Edward	VIII. 327, 347, 349, 403, 431
Kirkbride, T. S.	VIII. 349, 350, 355, 424, 431, 433
Langermann	VIII. 331
Mann, Horace	VIII. 346
Maudsley	VIII. 397, 400, 414, 424
Meyer	VIII. 341
Meynert	VIII. 336, 414
Morel	VIII. 341
Pienitz	VIII. 335
Pinel	VIII. 331, 333, 422, 430
Ray, Isaac	VIII. 342, 348, 350, 351, 353, 397, 431
Rush	VIII. 331, 341, 342, 431
Shew, A. M.	VIII. 385
Stewart, R. S.	VIII. 343, 425
St. Vincent de Paul	VIII. 329, 430, 431
Tuke, William	VIII. 337
Van der Kolk	VIII. 335
Virchow	VIII. 336, 431
Walker, C. A.	VIII. 411
Westphal, Charles	VIII. 336, 379, 380
Willis	VIII. 330

Inspection:—

Inspection of living animals and meat	IV. 10; VI. 178, 183
Inspection needed in infectious diseases	IX. 321
Inspection of slaughter-houses	VII. 4
Sanitary inspection of schools	V. 446

Intemperance:—

The use of intoxicating liquors as a beverage	I. 5
Alcoholic drinks, their use and abuse	II. 11
Replies to inquiries concerning the effect of intoxicating liquors on public health from correspondents in Massachusetts	II. 246
Circular addressed to representatives of the United States Government in every part of the world	II. 256
Replies from —	
Alexandria	II. 320
Ancona	II. 257
Athens	II. 257

Intemperance — *Continued.*

Replies from —

Basle	II. 260
Beirut	II. 310
Berlin	II. 264
Berne	II. 261
Bremen	II. 264
Ceylon	II. 311
Cape Haytien	II. 321
Cadiz	II. 267
Cologne	II. 274
Constantinople	II. 265, 266
Copenhagen	II. 268-273
Darien	II. 346
Dublin	II. 278
Edinburgh	II. 336
Elsinore	II. 280
Fayal	II. 289
Florence	II. 286
Frankfort-on-the-Main	II. 282
Funchal	II. 309
Geneva	II. 290
Japan	II. 316, 341
Leipsic	II. 291
Lima	II. 327
Liverpool	II. 292
London	II. 295
Malta	II. 296
Manchester	II. 297
Nicaragua	II. 323
Odessa	II. 300
Para	II. 328
Pernambuco	II. 329
Rotterdam	II. 340
Sandwich Islands	II. 341
San Juan del Sur	II. 331
St. Croix	II. 324
Teneriffe	II. 302
Toronto	II. 325
Trinidad de Cuba	II. 326
Trieste	II. 331
Utrecht	II. 344
Vienna	II. 303
Zanzibar	II. 321
Zurich	II. 308

Alcoholic liquors, their use and abuse, analysis of the information derived from correspondence throughout the globe . III. 6, 27

Intemperance — *Continued.*

Additional analysis of evidence as to the use and abuse of in-	
toxicating liquors	IV. 12, 133
Beer-shops and prohibitory laws	IV. 134
Inebriate asylums or hospitals	VI. 25
Drunkenness now and formerly	VI. 28
Sentimental regard for the drunkard	VI. 29
Treatment of the drunkard by the law	VI. 29
No systematic effort hitherto made to cure the drunkard as one	
diseased	VI. 30
Drunkards ought to be deprived of civil rights	VI. 32
Classification of drunkards in the asylum	VI. 36
Penal asylums	VI. 43
Asylum accommodations for women	VI. 43
Intemperance as a cause of pauperism	VI. 45
Intemperance and immorality in Lynn	VIII. 201
Intemperance	X. xxv

Intermittents:—

Typhoid fever and intermittents	II. 174
Periodic fevers in and about New Haven, Conn.	III. 64
Intermittent fever in Massachusetts	III. 62

Investigation:—

Subjects for investigation	I. 3, 14
Special investigations made under direction of the Board	II. 7; XI. 35
Subjects of present and future investigation	III. 13; XI. 40

Ireland:—

Small-pox and vaccination in Ireland	II. 7
--	-------

Iron:—

Process of galvanizing or zincking	VII. 62
--	---------

Irrigation:—

Irrigation of land	II. 241; VIII. 80, 92
The opportunity and possibility of utilizing sewage in the city of	
Worcester	IV. 109
Sewage irrigation	IV. 55; VII. 334; VIII. 80
Subsoil irrigation	VII. 334
Surface irrigation	VII. 335
Cost of irrigation	VII. 345

Jackson, James:—

Remarks on typhoid fever	II. 174
------------------------------------	---------

Jamaica Pond:—

Jamaica Pond	VII. 233
Analysis of water	VII. 236

Jarrow:—

Jarrow Building Company	II. 210
-----------------------------------	---------

Jarvis, E.:—

Proper provision for the insane	III. 7, 139
---	-------------

Jarvis, E. — *Continued.*

Insanity not an identity	III. 144
Insane to be separated from causes of their disease	III. 144
Self-limited mental diseases	III. 149
Hospitals for the insane	III. 151
Infant mortality	IV. 13, 193
Table showing ratio of deaths of children to births	IV. 196
Premature birth	IV. 198
Care of infancy	IV. 202
Diseases of infancy and childhood	IV. 204
Food and nutrition	IV. 206
Distillery milk	IV. 209
Foundlings	IV. 221
Political economy of health	V. 25, 333
Financial view of health	IV. 341
Moral aspects of health	V. 353

Jeffries, B. J.:—

Dangers from color-blindness	IX. xxii, 97
Hereditary	IX. 123
Color-blindness acquired or from disease or injury	IX. 125
Measures now taken to avoid danger	IX. 125
The danger from color-blindness is great	IX. 126
Difficulty of examinations in the United States	IX. 127
Conclusions	IX. 128
Bibliography	IX. 130

Jeffries, John:—

Case of poisoning by arsenic	III. 43
--	---------

Jefferson, T.:—

Grape-culture	III. 96
-------------------------	---------

Jews:—

Jewish customs affecting consumption	IV. 379
--	---------

Johnson, A. H.:—

Diphtheria in Salem	VIII. 445
Scarlet fever	IX. xxvi, 253
Varying fatality of scarlet fever	IX. 255
Mortality from scarlet fever	IX. 257
Annual mortality from scarlet fever in Massachusetts, 1856-75.	IX. 261
Order of succession of ten principal diseases, 1870-75	IX. 262
Relation between deaths and cases of scarlet fever	IX. 263
Relative fatality in Massachusetts.	IX. 265
Incomplete recoveries	IX. 266
Scarlet fever a disease of the young	IX. 268
Liability of the two sexes	IX. 269
General distribution of scarlet fever	IX. 270
Source and methods of contagion	IX. 270
Contagiousness	IX. 273
Review of testimony	IX. 282

Johnson, A. H., Scarlet Fever — *Continued.*

Long periods of infecting power	IX. 283
Susceptibility to scarlet fever	IX. 286
General sanitary surroundings	IX. 288
Influence of schools, etc.	IX. 293
Incubative and infective period	IX. 297
Period of incubation	IX. 298
Duration of infective period	IX. 300
Summary of evidence	IX. 301
Restrictive measures	IX. 301
Disinfectants and deodorants	IX. 302
Methods of suppressing scarlet fever	IX. 304
Difficulties in complete disinfection	IX. 311
Hospitals for infectious diseases in Great Britain	IX. 312
Hospitals, etc., needed	IX. 315
J. S. Taylor on disinfecting establishment in Liverpool	IX. 317
Skilled inspectors needed	IX. 321
Popular education	IX. 322
Local boards of health	IX. 322
All classes and persons interested in restricting infection	IX. 324
Summary	IX. 325

Jute:—

Pollution of rivers by jute-dyeing	VII. 47, 48
--	-------------

Kamtschatka :—

Drinking habits of Kamtschatka	III. 123
--	----------

Kennedy, Ivory:—

Dr. Kennedy on hospitals	V. 323
------------------------------------	--------

Kirkwood, J. P. :—

The pollution of rivers, an examination of the water-basins of the Blackstone, Charles, Taunton, Neponset, and Chicopee Rivers, with general observations on water-supplies and sewerage	VII. 21
Preliminary	VII. 23
Act to provide for an investigation of the question of the use of running streams as common sewers in its relation to the public health	VII. 23
Statistics of the river valleys	VII. 37
Woollen manufacture	VII. 37
Estimates of the waste stuff from the manufacture into cloth of thirty tons of wool	VII. 39
Cotton manufacture	VII. 42
Materials used for printing and dyeing calico	VII. 42, 44
Bleach-works	VII. 45
Cotton-bleaching	VII. 45
Linen and jute manufacture	VII. 46
Silk manufacture	VII. 49

Kirkwood, J. P., The pollution of streams, etc. — *Continued.*

Paper manufacture	VII. 50
Details of the North Esk paper manufacture	VII. 58
Metal manufacture	VII. 60
Analysis of waste liquors from iron, zinc, etc.	VII. 65
Composition of waste liquors from brass-foundries	VII. 67
Limits of poisoned water	VII. 69
Blackstone River	VII. 73
Mills, factories, etc., in the Blackstone-river Valley	VII. 74
Dry-weather flow, etc.	VII. 83
Analysis of Blackstone-river water	VII. 85
Additional notes by E. K. Clark	VII. 86
Neponset River	VII. 89
Notes by C. D. Ward	VII. 89
Statistics of Neponset River	VII. 90
Summary for Neponset Valley	VII. 94
Summary for certain points in the Neponset Valley	VII. 95
Charles River	VII. 97
Mills, factories, etc., in the Charles-river Valley	VII. 98
Additional notes by E. K. Clark	VII. 103
Analysis of statistics	VII. 105
Summer flow, etc.	VII. 106
Chicopee River	VII. 109
Additional notes of C. D. Ward	VII. 109
Mills, factories, etc., in the Chicopee Valley	VII. 110
Analysis of statistics	VII. 120
Summary of statistics for certain points in Chicopee Valley	VII. 121
Analysis of Chicopee water	VII. 123
Taunton River	VII. 123
River statistics, mills, factories, etc., of the Taunton Valley	VII. 124
Notes of F. L. Fuller	VII. 136
L. S. Drake on iron-works at Easton	VII. 137
Condensed statistics of the Taunton-river Valley	VII. 139
Analysis of Taunton-river water	VII. 141
Gaugings of several rivers of Massachusetts	VII. 142
General conclusions	VII. 144
The prevention of pollution	VII. 147
Drainage and sewerage	VII. 150

Labor:—

Cost of labor as influencing food	IV. 273
---	---------

Lakes:—

Lakes and great ponds	IV. 102
Extent	IV. 103
Capacity for furnishing water	IV. 103
Public property	IV. 105
Should be protected from pollution	IV. 107

Lausen:—

Enteric fever at Lausen VIII. 124

La Villette:—

Visit to La Villette in 1867 I. 36

Lawrence:—

Homes of the poor IV. 405

Lawrence water-works IV. 140

Dysentery in Lawrence V. 521

Laws:—

Act to establish the State Board of Health I. 7; III. 327

Law relating to the sale of poisons I. 38

Legislative results of last year's labor II. 3

Summary of English laws in regard to common lodging-houses II. 243

Building law in Boston III. 308

Revision and codification of health-laws IV. 7

Small-pox III. 9, 304

Adulteration of milk IV. 299

The law concerning slaughter-houses, and noxious and offensive

trades, III. 2, 229; IV. 7; V. 6; VI. 8; VII. 2; VIII. 3; IX.

vii; X. vii; XI. 5

Amending Act relating to slaughter-houses and noxious and

offensive trades VI. 13

Prohibitory laws IV. 133

Legislative enactments with regard to the sale of adulterated

milk IV. 299, 302

Law concerning vaccination III. 303; IV. 3

Act for the protection of the public health IV. 434

Health ordinance of Boston IV. 437

Vital legislation V. 363

Sanitary legislation in Europe V. 364

Existing state of the law concerning water-supply fouled by

sewage V. 125

Act to incorporate the Butchers' Slaughtering and Melting Asso-

ciation III. 227; VI. 197

Act to amend an Act to incorporate the Butchers' Slaughtering

and Melting Association in Brighton VIII. 3

Act concerning swine-slaughtering associations VI. 200

Treatment of the drunkard by the law VI. 29

Act to provide for an investigation of the question of the use of

running streams as common sewers in relation to the public

health VII. 8, 23

Act of Congress on transportation of live-stock VI. 88

Care of the insane VIII. 414

Pollution of streams, etc. VIII. 63, 73; IX. xvii; X. xxiii

Faults in the law governing registration VIII. 261

Project of a law on the care of the insane VIII. 414

New York law concerning committal of the insane VIII. 427

Laws — *Continued.*

A bill to provide for more accurate registration of vital statistics	XI. xiii
Act concerning the sewage of the State Prison at Concord	IX. xviii
Summary and draft of a law on pollution of streams	IX. 66, 73
An Act relating to boards of health in the several cities	X. xxxii, 251
Draft of law recommended by Board	X. xxxiii
Law appointing medical examiners	X. xxxvi
The regulation of the practice of medicine	X. xxxvii
Registration of vital statistics	X. xxxviii
Act relating to boards of health	XI. 32

Lead:—

Poisoning by lead	II. 8
Poisoning by lead pipe used for the conveyance of drinking-water	II. 21
Action of Cochituate water on lead pipe	II. 32
Solubility of salts of lead	II. 33
Literature of the subject	II. 38
Poisonous amounts of lead in water	II. 42
Susceptibility to lead poison	II. 42
Substitutes for lead pipe	II. 43
Lead pipe protected by certain salts	II. 33
Lead faucets in vinegar-barrels	III. 7

Leamington, Eng.:—

Leamington Sewage Farm	VII. 385
----------------------------------	----------

Leather manufacturers:—

Statistics of leather manufacturers of Woburn and Winchester for 1875	VII. 244
---	----------

Lenk:—

Lenk's process of treating sewage	VII. 333
---	----------

Library:—

Library on sanitary matters	X. xliv
---------------------------------------	---------

Liernur:—

Adam Scott on the Liernur system	VII. 313
D. W. Hoop on the Liernur system	VII. 317
V. de Brannen on the Liernur system	VII. 318
J. W. Schaap on the Liernur system	VII. 319
Liernur system	VIII. 82

Life:—

Life tables	V. 339
Increase of human life	V. 356
Interests of life should have precedence in legislation	V. 371

Lime process:—

Lime process of treating sewage	IV. 45; VII. 323
---	------------------

Lincoln Building:—

Crystal Palace, or Lincoln Building	III. 11; IV. 432
---	------------------

Lincoln, D. F.:—

Sanitation of public schools in Massachusetts	IX. xxiv, 227
---	---------------

Lincoln, D. F., Sanitation of public schools, etc. — *Continued.*

Site	IX. 229
Ventilation, heating, and dryness	IX. 231
Cellars	IX. 233
Water-closets, etc.	IX. 234
Ill effects on health	IX. 241
Contagious diseases	IX. 243
Boston schools	IX. 247
General conclusions	IX. 250
Rules for preventing the spread of contagion in schools . . .	IX. 252

Linen:—

Linen-bleaching	VII. 46
Pollution of water by linen manufacture . . .	VII. 46; VIII. 38

Little Pond:—

Little Pond in South Braintree	VI. 17; VII. 261
Little Pond, Cambridge	IX. 343

Little River:—

Little River, Haverhill	VII. 248
-----------------------------------	----------

Live-stock:—

The transportation of live-stock	VI. 18, 77
Our meat-supply and the public health	VI. 19

Lock-ups:—

Nuisances, and the doings of the Board thereupon . . .	I. 6
--	------

Lodging:—

Model lodging-houses and common tenements	I. 4
Houses for the people	II. 181
Operations of philanthropists for the improvement of the dwell- ings of the poor in London	II. 193
The Peabody Buildings	II. 194
Miss Burdett-Coutts's market-house, lodging-house, and reading- room at Columbia Square	II. 199
The Improved Industrial Dwelling Company	II. 201
Jarrow Building Company	II. 210
Model lodging-house and common tenement compared . . .	II. 218
Model lodging-house in Osborn Place, Boston	II. 219
Common tenement-house, or Crystal Palace so called . . .	II. 222
Summary of English laws in regard to common lodging-houses .	II. 243
Model-lodging and low-tenement houses	III. 10
Boston Co-operative Building Association	III. 11
Crystal Palace, or Lincoln Building	III. 11; IV. 432

London:—

Night stroll with an inspector of the London metropolitan police,	II. 183
Operations of philanthropists for the improvement of the dwell- ings of the poor in London	II. 193
The Peabody Buildings	II. 194
Miss Burdett-Coutts's market-house, lodging-house, and reading- room at Columbia Square	II. 199

London — *Continued.*

The Improved Industrial Dwelling Company	II. 201
Jarrow Building Company	II. 210
Allen's Buildings	II. 208
Waterlow Buildings	II. 204
London water	IV. 100; VII. 31; IX. 162

Lowell:—

Trichina disease in Lowell	II. 48
Homes of the poor	IV. 408
Sanitary reform in Lowell consequent upon small-pox epidemic .	IV. 408
Examination of filtering-scheme at Lowell	V. 135; IX. 191
Removable causes of disease in Lowell	V. 524
Health of Lowell	VII. 513
Board of Health	VII. 516
Diphtheria	VII. 516
Deaths in 1874-75	VII. 515
Cases treated in St. John's Hospital	VII. 515
Laws of diphtheria observed in the epidemic	VII. 524
Mortuary record of croup and diphtheria, 1846-76	VII. 516
Cases of poisoning from eating <i>cicuta maculata</i>	VII. 546
Well-water	VIII. 455

Ludlow Reservoir:—

Ludlow or Springfield Reservoir	VII. 271
Analysis of water	VII. 273

Lynn:—

Homes of the poor	IV. 410
Mortality since introduction of water	VII. 251
Examination of water from Lynn	VII. 254
Sanitary condition of Lynn	VIII. 11, 169
Natural conditions affecting health	VIII. 171
Situation	VIII. 171
Topography	VIII. 171
Fresh waters	VIII. 172
Soil	VII. 249; VIII. 173
Subsoil	VIII. 173
Rocks	VIII. 174
Natural drainage	VIII. 174
Climate	VIII. 176
Temperature	VIII. 177
Prevailing winds	VIII. 178
Weather	VIII. 178
Rainfall	VIII. 178
Relative humidity of the air	VIII. 179
Population	VIII. 180
Rate of increase	VIII. 180
Sources of increase	VIII. 181
Nationality	VIII. 181

Lynn, Population — *Continued.*

Age distribution	VIII. 182
Sexes	VIII. 183
Occupation	VIII. 183
Intelligence	VIII. 183
Wealth	VIII. 183
Pauperism	VIII. 184
Artificial conditions affecting health	VIII. 184
Water-supply	VIII. 184
Wells	VIII. 184
Sewerage	VII. 249, 257; VIII. 190
House-drainage	VIII. 192
Surface-drainage	VIII. 193
Under-drainage	VIII. 193
Drainage of factories	VIII. 194
Night-soil	VIII. 195
Garbage	VIII. 197
Dry refuse	VIII. 198
Piggeries	VIII. 198
Dwellings	VIII. 198
Site	VIII. 198
Construction	VIII. 199
Management	VIII. 199
Shoe-shops	VIII. 199
Intemperance and immorality	VIII. 201
Rates of mortality	VIII. 202
Annual death-rate of Lynn, 1851-75	VIII. 202
Death-rate and birth-rate compared	VIII. 204
Deaths per 1,000 at specified ages	VIII. 205
Mortality of natives and foreigners	VIII. 206
Prevailing diseases	VIII. 209
Deaths from consumption for five census years	VIII. 216
Health of different districts and streets	VIII. 218
Concluding remarks	VIII. 227
McFarland, Andrew:—	
Care of the insane	VIII. 382
Insane in Illinois	VIII. 405
McLean Insane Asylum:—	
Establishment and workings of McLean Insane Asylum	VIII. 344
Malaria:—	
Intermittent fever in Massachusetts	III. 62
Periodic fevers in and around New Haven, Conn.	III. 64
Fevers of a remittent type in Springfield	IV. 462
Malaria in Lynn	VIII. 214
Malignant vesicle:—	
Charbon, or malignant vesicle, in Massachusetts	II. 9, 86

Mallet:—

Cast iron in simple contact with zinc immersed in fresh water . . . V. 492

Manchester:—

Manchester pail-closet system VII. 183

Manufactories:—

Health of minors employed in manufactories II. 16, 409

Maps and plans:—

Improved houses for the people II. 208

Health-districts of the city of Boston in 1870 II. 368

Ventilation of schoolhouses II. 384

Region drained by Mystic Pond II. 394

Chart illustrating use and abuse of stimulants III. 112

Temporary connection of Sudbury River with Lake Cochituate, . . V. 112

Filter-dams, Pegan Brook V. 114

Plan of Brighton Abattoir V. 163

Sewerage in Salem VI. 349

Russell Brook in Woburn VI. 358

Index map to principal river-basins within the State of Massa-

chusetts VII., opposite title

Brighton in 1870 VII. 7

Blackstone River VII. 73

Neponset River VII. 96

Charles River VII. 108

Chicopee River VII. 122

Taunton River VII. 144

Boston, 1875 VII. 232

Cochituate Lake and other sources of water-supply of Bos-

ton, 1875 VII. 242

Head waters of Mystic Pond VII. 244

Little River, Haverhill VII. 248

Sewerage of Lynn VII. 257

Salem and Peabody VII. 258

South Braintree VII. 262

Croydon Sewage Farm VII. 373

Bradford Irrigation Farm VII. 378

Heathcote Farm VII. 386

Merthyr Tydfil VII. 387

Dantzic VII. 394

Durham-county Asylum VII. 395

Part of Worcester and Millbury VII. 406

A typhoid-fever locality VII. 414

Pond at Rye Beach VII. 471

Boston and vicinity VII. 512

Nashua River VIII. 70

Sewage-farm of the Worcester Insane Hospital VIII. 80

Enteric fever at Lausen VIII. 125

Plan of house and grounds showing disconnection and ventila-

tion of soil-pipes and other house-drains VIII. 134

Maps and plans — *Continued.*

Willard Asylum for the Insane	VIII. 354
Lynn	VIII. 226
Diphtheria in Lynn	VIII. 444
Diphtheria in Salem	VIII. 447
South Dennis	VIII. 496
Housatonic River	IX. 26
Hoosac River	IX. 50
Pittsfield House of Mercy	IX. 91, 93
Disinfecting establishment in Liverpool	IX. 318
Cambridge	IX. 372
Taunton	IX. 496
Hospital home for 200 insane patients	X. 2
Plans of hospital	X. 32
Cambridge water-supply	X. 226
Boston City Hospital	X. 229, 248

Marshes:—

Fresh and salt water marshes and their evils in a sanitary point of view	VII. 510
---	----------

Martha's Vineyard:—

Typhoid fever in Martha's Vineyard	II. 143, 172
--	--------------

Martin, A. C.:—

The ventilation of schoolhouses	II. 14, 369
The Brighton Abattoir	V. 164

Massachusetts State Prison:—

Analysis of air	VI. 377
Mortality rate, 1820-1874	VI. 366
Mortality rate, 1828-1864, according to length of sentence	VI. 373
Mortality and sickness rate, 1821-1874	VI. 369
Present unhealthy influences	VI. 378
Relative accommodation of wings	VI. 376
Ventilation	VI. 376

Meat:—

Need of inspection of meat	II. 3
Meat from diseased cattle	II. 432
Extracts of meat	IV. 271
Our meat-supply and public health	VI. 19, 133
Boston live-stock market	VI. 110
Quality of beef cattle	VI. 118
Putrid meat	VI. 137
Parasites	VI. 142
Precautions	VI. 155
Parasites affecting sheep	VI. 157
Chronic diseases of animals	VI. 158
Acute diseases of animals	VI. 158
Pleuro-pneumonia	VI. 159
Hoof and mouth disease	VI. 159

Meat, Acute diseases of animals — *Continued.*

Rinderpest	VI. 160
Anthrax	VI. 161
Texas cattle disease	VI. 163
Milk-sickness	VI. 165
Hog-cholera	VI. 165
Glanders	VI. 165
Diseased meat in general	VI. 166
Tests of diseased meat	VI. 167
Severely bruised meat	VI. 168
Effects of starving	VI. 168
Meat from very young animals	VI. 168
Salted or pickled meat	VI. 169
Bad meat easily sold	VI. 169
Effects of terror	VI. 169
Routes of travel for meat	VI. 120
Effects of exhaustion	VI. 173
Effects of articles of food	VI. 174
Amount of meat condemned	VI. 175
Standard for condemned meat	VI. 176
Remedies, inspection	VI. 178
Advantages of inspection	VI. 183

Medford:—

Typhoid investigation in Medford	V. 526
--	--------

Medical examiners:—

Law appointing medical examiners	X. xxxvi
--	----------

Medicine:—

Preventive medicine	V. 22, 29
. The regulation of the practice of medicine	X. xxxvii

Medway:—

Water-supply, sewerage, etc.	VII. 104
--------------------------------------	----------

Menstruation:—

Age at which menstruation usually begins in American women, VIII. 284	
---	--

Meriam, J. N.:—

Report of the Butchers' Slaughtering and Melting Association	IV. 443; VI. 187
The Brighton Abattoir	V. 153

Merrick, J. M.:—

Examination of Charles-river water	V. 152
Chemical analysis of pearl butter	VI. 196

Merrimac River:—

Merrimac River at Lowell	IV. 89
Examination of Merrimac River	IV. 90
Merrimac River	V. 64
Examination of Merrimac River	V. 70
Amount of water flowing in Merrimac River	V. 80
The Merrimac River as a source of water-supply	V. 132

Merrimac River—*Continued.*

Pollution of the Merrimac	VIII. 68
The Merrimac and other waters	VIII. 70

Merthyr Tydfil, Wales:—

Merthyr Tydfil Sewage Farm	VII. 387
--------------------------------------	----------

Metal manufacture:—

Pollution of rivers by metal manufactures	VII. 60
Analysis of waste liquors from iron-wire and galvanizing works,	VII. 65
Composition of waste liquors from brass foundries	VII. 67
Limits of poisoned water	VII. 69

Metric system:—

Tables	VII. 18; VIII. 16; IX. xxxviii; X. xlv
------------------	--

Milford:—

Water-supply, sewerage, etc.	VII. 104
--------------------------------------	----------

Milk:—

Report on the use of milk from cows affected with “foot and mouth disease”	II. 4, 425
Adulteration of milk	IV. 14, 277
Distillery milk	IV. 209
Composition of milk	IV. 281
Methods of examination	IV. 283
Methods of adulteration	IV. 285
Milk in Boston and vicinity	IV. 290
Analyses by J. F. Babcock	IV. 291
Legislative enactments with regard to the sale of adulterated milk.	IV. 299
Milk-sickness	VI. 165
Contaminated milk a source of disease	VIII. 122
Fever from watered (?) milk	VIII. 122
Milk as a vehicle of contagion in scarlet fever	IX. 325

Mill Brook:—

Mill Brook, Worcester	IV. 83, 84
---------------------------------	------------

Milldams:—

Milldams and water-obstructions	III. 6. 59
Boston and Roxbury Milldam Corporation	III. 68
Tide-mills in Salem	III. 68; VII. 258
Tide-mill in Charlestown	III. 69
Milldam in Danversport	III. 70

Miller's River:—

Miller's River in East Cambridge and Somerville	III. 70
Miller's River commission	V. xvi, 8, 16

Mind:—

Proper position for the insane	III. 7, 139
Insane to be separated from causes of the disease	III. 144
Self-limited mental diseases	III. 149
Hospitals for the insane	III. 151
Insanity	V. 382

Mind — *Continued.*

Insanity among farmers	V. 242
Cost of restoring the insane	V. 384
Burden of insanity in Massachusetts	V. 387
Constant recurrence of insanity	V. 389
Disease of the mind	VIII. 13, 325
Early treatment of the insane	VIII. 327
Pinel's reform, and European progress	VIII. 332
France	VIII. 332
Germany	VIII. 334
English progress and Conolly	VIII. 337
Conolly's work	VIII. 339
American progress	VIII. 341
Period of American leadership	VIII. 347
American principles of treatment	VIII. 350
Later progress	VIII. 353
Present condition	VIII. 356
The twenty-years' leadership	VIII. 358
Modern methods of less restraint	VIII. 358
Opinions and letters	VIII. 361
Dr. Bucknill	VIII. 361
Drs. Tuke and Fraser	VIII. 362
Dr. Clouston	VIII. 368
Sir James Coxie	VIII. 371
Dr. Rogers	VIII. 373
Tue-Brook Villa	VIII. 376
West Riding Asylum	VIII. 377
Charles Westphal	VIII. 379
Munich	VIII. 380
H. P. Stearns	VIII. 381
Andrew McFarland	VIII. 382
Less-restraint methods considered	VIII. 382
Management and curability	VIII. 384
A. M. Shew	VIII. 385
Position of English and European experts	VIII. 386
Edgar Sheppard	VIII. 386, 387
Dr. Yellowlees	VIII. 387
Substitutes for restraint	VIII. 390
Accidents considered	VIII. 390
James Wilkes on fatal accidents	VIII. 392
Question of escapes	VIII. 394
Summary of restraint question	VIII. 394
Responsibility for crime, and definitions of insanity	VIII. 397
Massachusetts statistics and asylum accommodation	VIII. 401
Mark Ranney on accommodation for insane	VIII. 405
Andrew McFarland on insane in Illinois	VIII. 405
Supervision by the State	VIII. 406

Mind — *Continued.*

Committal to asylums	VIII. 406
Improper committals	VIII. 407
More or better supervision	VIII. 408
Uses of a commission	VIII. 408
False position of American Association	VIII. 409
Complaints of discharged patients	VIII. 410
Best supervision	VIII. 411
Good asylums, as a rule, better than homes	VIII. 413
Project of a law	VIII. 414
J. C. Bucknill on supervision of insane	VIII. 417
Certain asylum needs	VIII. 421
Education in hygiene	VIII. 421
Better hospitals and trained nurses	VIII. 423
Medical education	VIII. 426
New York law concerning committal of insane	VIII. 427
Summary	VIII. 430

Minors : —

Health of minors employed in manufactories of cotton, woollen, silk, flax, and jute	II. 16, 409
Abstract of manufacturers' replies	II. 412
Table showing comparative mortality among minors in the State of Massachusetts at large, and those employed in mills	II. 420

Model house: —

Model house and common tenement-house compared	II. 218
<i>See also "Lodging."</i>	

Morin: —

Experiments with ventilation	II. 379
Heating and ventilation	VI. 237

Morison, J.: —

Drunkenness in California	III. 116
-------------------------------------	----------

Mortality: —

Mortality in the centres of population	I. 17
Mortality from consumption in Massachusetts	I. 47
Death rates of Brighton	I. 24
Diminished mortality in New York	I. 56
Mortality among minors in factories	II. 16, 420, 422
Table of deaths of persons above five years of age from typhoid fever in Massachusetts during the years 1859-68	II. 114
Table showing relative mortality for the ten years, from typhoid fever in persons above five years of age, in the larger and smaller cities and towns	II. 118
Table of deaths from typhoid and typhus fevers in Boston, 1846-67	II. 125
Table of deaths from typhoid fever in Boston compared with a fixed number of the living in each year	II. 126
Mortality of the city of Boston	II. 13, 349; VI. 334; VII. 15

Mortality — *Continued.*

Analysis of the mortality of Boston in 1870	II. 354
Weekly report of deaths	III. 13
Infant mortality	IV. 13, 193
Table showing ratio of deaths of children to births	IV. 196
Mortality of cities and towns in Massachusetts	VIII. 204, 270, 497
Deaths from cerebro-spinal meningitis in Boston	V. 279
Mortality in childhood	V. 341
Mortality of city and country	V. 368
Mortality of prisons compared	VI. 371
Death-rates according to the length of sentences	VI. 373
Mortality-rate of Boston from 1870 to 1874	VI. 334
Mortality-rate of British army, 1872	VI. 61
Mortality-rate of Chelsea, Charlestown, and Somerville	VI. 336
Mortality-rate of hospitals	VI. 61
Mortality-rate of London	VI. 70
Mortality-rate of Massachusetts	VI. 67-69
Reduction of mortality-rate in England by water-supply and drainage	VI. 70, 72
Mortality of Boston compared with that of London, Eng.	VII. 496, 551
Mortality-rate of East Boston from 1870 to 1874	VI. 335
Registration of deaths and of diseases	VIII. 12, 231
Mortality in Lynn	VIII. 202
Mortality from scarlet fever	IX. 257
Annual mortality from scarlet fever in Massachusetts, 1856-75	IX. 261
Relation between deaths and cases of scarlet fever	IX. 263
Relative fatality in Massachusetts	IX. 265
Mortality of Cambridge	IX. 354
Death-rates for the year	X. 234
Deaths and meteorology	X. 286

Moule:—

Moule's dry earth-closet	VII. 300
Experiments on the ground atmosphere	VI. 210, 212, 214

Munich:—

Care of the insane	VIII. 380
------------------------------	-----------

Munroe, W. F.:—

Intoxicating drinks in Northern Europe	III. 122
--	----------

Mystic Pond:—

Mystic-pond water	II. 15
Examination of the water of Mystic Pond, and of its sources of supply	II. 385
Report of W. R. Nichols	II. 387
Exposure to pollution	IV. 106
Mystic water	V. 127
Examination of Mystic Lake	V. 130
Mystic Pond	VII. 233, 238
The fouling of Mystic water	V. 127; VI. 336

Nashua River:—

Nashua-river Basin	VIII. 21
Water-supply and sewerage	VIII. 24
Area and population	VIII. 22
Statistics of Nashua River	VIII. 25
Summary of statistics	VIII. 34
Pollution from mills	VIII. 35
E. K. Clark's account of Nashua River	VIII. 38
Replies of correspondents	VIII. 42
Summary of survey	VIII. 46
Analysis of water	VIII. 48, 52, 56
Pollution of Nashua River	VIII. 61
Disposal of sewage in the Nashua Basin	VIII. 64
Nashua River beyond the State line	VIII. 67

National Board of Health:

National Board of Health	X. xxxi
------------------------------------	---------

Needham:—

Water-supply, sewerage, etc.	VII. 104
--------------------------------------	----------

Neponset River:—

Neponset River	V. 102; VII. 21, 89
Notes by C. D. Ward	VII. 89
Statistics for Neponset River	VII. 90
Summary for Neponset Valley	VII. 94
Summary for certain points in the Neponset Valley	VII. 95
Examination of Neponset River	V. 103
Analysis of water	VII. 96, 156, 162

New Haven:—

Periodic fevers in and around New Haven, Conn.	III. 64
--	---------

Newton:—

Water-supply, sewerage, etc.	VII. 103
--------------------------------------	----------

New York:—

Butchers' Hide and Melting Association	I. 27
Diminished mortality in New York	I. 56
New York slaughter-houses	III. 233

Nichols, A. H.:—

Charbon in Massachusetts	II. 9, 85
Symptoms	II. 87
Symptoms in animals	II. 89
Morbid changes in the tissues and internal organs	II. 90
Theoretical considerations as to the nature of the morbid poison or contagium in charbon	II. 91
Methods and sources of infection	II. 97
Observations on the epidemic at Walpole	II. 99
On the value and application of disinfectants or antiseptics	II. 104
Report on the use of milk from cows affected with "foot and mouth disease" (aphtha epizootica)	II. 425
Sewing-machines	III. 8, 179

Nichols, A. H. — *Continued.*

History of sewing-machines	III. 180
Saving of time and labor by sewing-machines	III. 183
Alleged ill effects caused by sewing-machines	III. 183
Investigations by Dr. Decaisne concerning sewing-machines	III. 185
Effects of sewing-machines on health in Massachusetts	III. 188
Opinions of physicians	III. 189
Opinions of operatives and employers	III. 199
Remedies to be applied	III. 215
New attachments	III. 216
Tirrell's electro-magnetic motor	III. 216
Parsons's treadle	III. 217
Hall's treadle	III. 218
General conclusions	III. 221
Adulteration of milk	IV. 14, 277
Composition of milk	IV. 281
Methods of examination	IV. 283
Methods of adulteration	IV. 285
Milk in Boston and vicinity	IV. 290
Analyses by J. F. Babcock	IV. 291
Legislative enactments with regard to the sale of adulterated milk	IV. 299
Act to prevent the sale or exchange of adulterated milk	IV. 302
Conclusions	IV. 303
Typhoid fever in Medford	V. 526
Outbreak of intestinal disorder attributable to the contamination of drinking-water by means of impure ice	VII. 14, 465
Rye Beach	VII. 467
Analysis of water	VII. 470, 473

Nichols, W. R.:—

Poisoning by lead	II. 8, 32
Mystic-pond water	II. 15
Report on Mystic-pond water	II. 387
Analyses	IV. 108
On the present condition of certain rivers of Massachusetts, together with considerations touching the water-supply of towns	V. 23, 61
Merrimac River	V. 64
Examination of Merrimac River	V. 70
Blackstone River	V. 82
Examination of Blackstone River	V. 83
Charles River	V. 90
Examination of Charles River	V. 92
Sudbury and Concord Rivers	V. 96
Examination of Sudbury and Concord Rivers	V. 98
Neponset River	V. 102
Examination of Neponset River	V. 103

Nichols, W. R. — *Continued.*

On rivers as a source of water-supply	V. 103
Present condition of the water-supply of certain cities of Massachusetts	V. 111
Cochituate Lake and its sources of supply	V. 111, 116
Mystic water	V. 127
Examination of Mystic Lake	V. 130
The Merrimac River as a source of water-supply	V. 132
Examination of filtering scheme at Lowell	V. 135
Lawrence Water-works	V. 140
Charles River as a source of water-supply	V. 142
Examination of filtering-scheme at Waltham	V. 144
Methods of analysis	V. 148
J. M. Merrick's examination of Charles-river water	V. 152
Action of water upon zincked pipe	V. 495
Composition of the air of the ground atmosphere	VI. 20, 205
Amount of carbonic acid, Dresden and Munich	VI. 209, 210, 212
Boston Back Bay	VI. 217, 218
Examination of air in Boston Back Bay	VI. 213
The air in the soil above decomposing bodies	VI. 221
Rapid diffusion of carbonic acid	VI. 224
Examination of air of railroad-cars	VI. 20, 229
Analysis of Blackstone-river water	VII. 85
Analysis of Chicopee-river water	VII. 123
Analysis of Taunton-river water	VII. 140
Analyses of water of Massachusetts rivers	VII. 155
Chicopee Valley	VII. 123, 155, 166
Blackstone Valley	VII. 85, 156, 158
Neponset Valley	VII. 96, 156, 162
Taunton Valley	VII. 141, 156, 168
Charles River	VII. 107, 157, 164
Methods of analysis	VII. 174
Springfield or Ludlow Reservoir	VII. 271
Examination of water from Ludlow Reservoir	VII. 273
Examination of water from Pittsfield	VII. 275
Examination of water in vicinity of cemeteries	VI. 292, 295, 297, 298
Examination of water at Rye Beach	VII. 470, 473
Chemical examinations in the Housatonic Valley	IX. 24
Chemical examinations in the Hoosac Valley	IX. 35
Chemical examinations in North Adams	IX. 50
Water from Nashua-river Basin	VIII. 48
The filtration of potable water	IX. xxiv, 137
Introduction	IX. 139
Artificial filtration on the large scale	IX. 141
Description of American filter-beds	IX. 146
Filtering-works	IX. 149
Hudson, N.Y.	IX. 149

Nichols, W. R. — *Continued.*

Columbus, O.	IX. 151
Toledo, O.	IX. 151
Other American localities	IX. 151
Object and results of filtration on the large scale	IX. 153
Observations on the water of the various London companies	IX. 162
Examination of water from Poughkeepsie, N.Y.	IX. 164
Examination of water from Hudson, N.Y.	IX. 167
Experiments at Springfield.	IX. 168
Examination of water from Springfield	IX. 171
Conclusions	IX. 173
Natural filtration	IX. 175
Circular	IX. 177
C. O. Chapin on filtering-gallery on the Westfield River	IX. 180
Character and proximate source of the water	IX. 182
Lowell	IX. 191
Waltham	IX. 191
Examination of water from Waltham	IX. 193
Observations on water-levels, Waltham Water-works	IX. 196
Observations on temperature, Waltham	IX. 199
Taunton	IX. 200
Examination of water from Taunton	IX. 202
Conclusions	IX. 203
Household filtration	IX. 205
Examination of filter of animal charcoal	IX. 211
Examination of spongy iron filter	IX. 214
Examination of cistern-water filtered through brick walls	IX. 219
Note, with reference to the methods of analysis	IX. 222
Bibliography	IX. 224
Examination of water from Gloucester	IX. 475
The absorbing of the soup from the Belmont Slaughter-house by means of muck	XI. 6
Nickerson, Frank:—	
The health of Lowell, 1875	VII. 513
Board of Health	VII. 516
Diphtheria in Lowell	VII. 516; VIII. 451
Nightingale, Florence:—	
Hospitals	V. 320
Niles Brothers:—	
Citizens of Cambridge v. Messrs. Niles Brothers	X. xviii, 111; XI. 5
Nitro-benzole:—	
Nitro-benzole, or oil of mirbane	IV. 157
North Adams:—	
Topography of, and disease in, North Adams	IX. 47
Examination of water from North Adams	IX. 51
Natural drainage	IX. 48
Necessity for better sanitation	IX. 50

North Adams — *Continued.*

Sanitary condition IX. 48

Soil unfavorable to health IX. 49

Northbridge:—

Water-supply, sewerage, etc. VII. 86

North Esk:—

Details of the North Esk paper manufacture VII. 58

North River, Salem:—

Use of North River as a sewer VII. 258

Norway:—

Use of intoxicating liquors in Norway III. 121, 122

Noxious and offensive trades:—

Vote concerning prosecution of persons maintaining nuisances,

Slaughtering, bone-boiling, and fat-melting III. 223

The law concerning slaughter-houses and noxious and offensive

trades III. 2, 229; IV. 7; V. 6; VI. 8, 13; VII. 2; VIII. 3;

IX. vii; X. vii; XI. 5

Miller's River district in Cambridge and Somerville V. 8

Correspondence with Charlestown officials V. 10

Report of Board of Health of Somerville V. 11

Reply of Board of Health V. 12

Address of chairman of Board to parties complained of V. 14

Case of city of Cambridge *v.* Niles Brothers X. 111; XI. 5

Index X. 113

Petition of city of Cambridge X. 115

Remonstrance of Niles Brothers X. 116

Hearings X. 117

License X. 117

Analysis of samples of water and ice X. 119

Arguments and evidence X. 121

Examination of witnesses X. 125

Case of respondents X. 164

Mr. Warren's closing argument X. 208

Mr. Hammond's closing argument X. 220

Report on the absorbing of the soup from the Belmont Slaughter-
house by means of muck XI. 6

Bradley Fertilizer Company XI. 11

Complaints under the law regarding noxious and offensive
trades XI. 12

Nuisances:—

Nuisances, and the doings of the Board thereupon I. 6, 18

Lock-ups I. 6

Slaughter-house piggeries I. 23

Disposition made of dead animals I. 26

Slaughter-houses and noxious and offensive trades III. 2

Slaughtering, bone-boiling, and fat-melting III. 5

Correspondence with Charlestown officials V. 10

Nuisances — *Continued.*

Report of Board of Health of Somerville on Miller's River nuisance	V. 12
Reply of Board of Health	V. 14
Address of chairman of Board to parties complained of . . .	V. 14
Nuisance districts	V. 16

Nutrition:—

Nutrition of persons of consumptive tendencies	V. 41
--	-------

Occupations:—

Occupations affecting health	V. 473
--	--------

Office:—

Office for business of Board	I. 6, 19; VI. 22
--	------------------

Oliver, F. E.:—

The use and abuse of opium	III. 8, 161
Opinion of S. D. Hayes	III. 166
Health of Boston, 1875	VII. 493

Oliver, Gen. H. K.:—

Half-time system in schools	V. 425
---------------------------------------	--------

Oliver, H. K., jun.:—

Character of substances used for flavoring articles of food and drink	IV. 12, 145
Essential oil of bitter almonds	IV. 148
Nitro-benzole, or oil of mirbane	IV. 157
Artificial fruit-essences	IV. 158
Fruit-jellies	IV. 164
Artificial essences in alcoholic liquors	IV. 166
Tartaric acid as a substitute for fruit	IV. 169
Spontaneous change in the extract or essence of vanilla . . .	IV. 172

Opium:—

The use and abuse of opium	III. 8, 161
Opinion of S. D. Hayes	III. 166
Importation of opium in the United States	III. 163
Correlative uses of opium and alcohol	III. 169
Different preparations of opium	III. 175
Proximate causes of the opium habit	III. 167
Remedies for the opium habit	III. 176

Organic matter:—

Organic matter in air	I. 52
---------------------------------	-------

Paget, James:—

Air of hospitals	V. 324
----------------------------	--------

Paper manufacture:—

Pollution of streams by paper manufacture	VII. 50; VIII. 37
Details of the North Esk paper manufacture	VII. 58

Parasites:—

Vegetable parasites, and the diseases caused by their growth on man	III. 9, 247
---	-------------

Parasites — *Continued.*

Nature of vegetable parasites	III. 249
Diseases to which they give rise upon man	III. 253
Pseudo-parasites	III. 276
Their growth upon the domestic animals	III. 277
Their supposed identity, and their relations to common moulds .	III. 278
Common sources of contagion, and precautions to be used against them	III. 287
Ringworm	III. 258
Pityriasis versicolor	III. 268
Alopecia areata	III. 270
Myringomycosis	III. 274
Parasites of animals	VI. 142
Precautions	VI. 155
Parasites affecting beef	VI. 157
Pork	VI. 155
Sheep	VI. 157
Paris: —	
Abattoir of Paris	I. 36
Disposal of sewage	VIII. 106
Registration of disease	VIII. 265
Sewerage of Paris	V. 177; VIII. 106
Irrigation below Paris	VIII. 105
Parsons, C. C.: —	
Parsons's treadle for sewing-machines	III. 217
Parker House: —	
Parker-House bread	IV. 263
Pathologists: —	
Pathologists for insane asylums	VIII. 354
Pauperism: —	
Intemperance as a cause of pauperism	VI. 45
Peabody: —	
The Peabody Buildings	II. 194
Peabody, Mass.: —	
Proctor's Brook in Peabody	VII. 224
Pearl butter: —	
Examination of pearl butter	VI. 196
Pearson, A. H.: —	
Examination of air in Boston	II. 399
Pearson, F. P.: —	
Analyses	IV. 108
Pegan Brook: —	
Water of Pegan Brook	V. 113
Penal asylums: —	
Penal asylums for inebriates	VI. 43
Peppermint: —	
Detecting drain-leaks by oil of peppermint	X. 99, 107

Perkins, A. C. :—

Long school sessions V. 411

Perry, H. J. :—

Use of Spanish wines III. 119

Pettenkofer, Dr. :—

Dr. Pettenkofer on typhoid fever II. 112, 175

Phelps, R. H. :—

Grape-culture III. 97

Philbrick, E. S. :—

Defects in house-drainage, and their remedies . . . VII. 13, 423

Drains between the house and sewer or other receptacle . . VII. 426

Drains within the house-walls VII. 435

Public privies VII. 456

Workmanship VII. 460

Duties of proprietors and occupants VII. 464

Phosphate process :—

Phosphate process of treating sewage IV. 51

Physicians :—

Physicians of the future V. 22, 29

Prescriptions of physicians I. 41

Pickles :—

Adulteration of pickles IV. 393

Pierson, A. L. :—

Charbon in Salem II. 103

Piggeries :—

The slaughter-house piggeries I. 23

Piggeries in Lynn VIII. 198

Pinkham, J. G. :—

The sanitary condition of Lynn VIII. 11, 169

Natural conditions affecting health VIII. 171

Situation VIII. 171

Topography VIII. 171

Fresh waters VIII. 172

Soil VIII. 173

Subsoil VIII. 173

Rocks VIII. 174

Natural drainage VIII. 174

Climate VIII. 176

Temperature VIII. 177

Prevailing winds VIII. 178

Weather VIII. 178

Rainfall VIII. 178

Relative humidity of the air VIII. 179

Population VIII. 180

Rate of increase VIII. 180

Sources of increase VIII. 181

Nationality VIII. 181

Pinkham, J. G. — *Continued.*

Age distribution	VIII. 182
Sexes	VIII. 183
Occupation	VIII. 183
Intelligence	VIII. 183
Wealth	VIII. 183
Pauperism	VIII. 184
Artificial conditions affecting health	VIII. 184
Water-supply	VIII. 184
Wells	VIII. 184
Sewerage	VIII. 190
House-drainage	VIII. 192
Surface-drainage	VIII. 193
Under-drainage	VIII. 193
Drainage of factories	VIII. 194
Night-soil	VIII. 195
Garbage	VIII. 197
Dry refuse	VIII. 198
Piggeries	VIII. 198
Dwellings	VIII. 198
Site	VIII. 198
Construction	VIII. 199
Management	VIII. 199
Shoe-shops	VIII. 199
Intemperance and immorality	VIII. 201
Rates of mortality	VIII. 202
Annual death-rate of Lynn, 1851-75	VIII. 202
Death-rates and birth-rates compared	VIII. 204
Deaths per 1,000 at specified ages	VIII. 205
Mortality of natives and foreigners compared	VIII. 206
Prevailing diseases	VIII. 209
Deaths from consumption for five census years	VIII. 216
Health of different districts and streets	VIII. 218
Concluding remarks	VIII. 227
Diphtheria in Lynn	VIII. 437
Pittsfield:—	
House of Mercy	IX. 81
Typhoid fever in vicinity of Pittsfield	IV. 458; V. 534
Examination of water from Pittsfield	VII. 275
Ice-supply	VII. 274
Pleuro-pneumonia:—	
Pleuro-pneumonia	VI. 159
Plunkett, Mrs. T. F. :—	
Some farmhouses and some mistaken ways of living in them	V. 249
Poisons:—	
Sale of poisons	I. 3, 38
Sale and use of poisons	VI. 7

Poisons — *Continued.*

Law relating to the sale of poisons	I. 38
Apothecaries	I. 40
Prescriptions of physicians	I. 41
Poisoning by lead	II. 8
Poisoning by lead pipe used for the conveyance of drinking-water	II. 21
Action of Cochituate water on lead pipe	II. 32
Literature of the subject	II. 38
Use and abuse of opium	III. 8
Arsenic in certain green colors	III. 6, 17
Arsenic as a pigment	III. 19, 29
In artificial flowers	III. 21
In dresses	III. 25
In confectionery and toys	III. 26
In papers	III. 30, 33
Signs of arsenical poisoning	III. 47
Methods of poisoning	III. 48
Susceptibility to poisoning	III. 51
Effect of arsenic on workmen	III. 22, 53
Test for arsenic	III. 20
Limits of poisoned water	VII. 218
Three cases of poison from eating cicuta maculata	VII. 546
Poisoning from use of arsenical paper	VII. 547
Arsenic	X. xxxix
Coal-gas	X. 75
Lead pipes	X. 253, 281

Political economy:—

Political economy of health	V. 25, 333
---------------------------------------	------------

Polli:—

Polli's method of cremation	VI. 255
---------------------------------------	---------

Pollution of streams. *See* "Towns."

Ponds:—

Lakes and "great ponds"	IV. 102
Great ponds public property	IV. 105
Great ponds of Massachusetts	IV. 117
Homes for the poor	I. 4; II. 10, 181

Poor:—

Organized work among the poor	II. 212
Summary of investigations	II. 217
House accommodation of the poor in our most populous cities	IV. 15

Pork:—

Pork as an article of diet	V. 219
Pork-packing in the East and West	V. 17

Portuguese:—

Portuguese in Boston	IV. 399
--------------------------------	---------

Poughkeepsie:—

Examination of water from Poughkeepsie, N.Y. . . . IX. 164

Precipitation:—

Precipitation process of treating sewage . . . VII. 326; VIII. 82, 95

Precipitation of sewage by metallic salts . . . VII. 332

Preventive medicine:—

Prevention and cure of disease . . . V. 34

Preventive medicine and the physician of the future . . . V. 22, 29

Residence . . . V. 38

Nutrition . . . V. 41

Clothing . . . V. 45

Care of the skin, bathing . . . V. 46

Recreation . . . V. 48

Education . . . V. 50

Profession and trade . . . V. 51

Exercise . . . V. 52

Walking . . . V. 53

Running . . . V. 53

Dancing . . . V. 55

Horseback exercise . . . V. 56

Driving . . . V. 57

Gymnastics . . . V. 57

Boxing . . . V. 57

Bowling . . . V. 58

Rowing . . . V. 58

Swimming . . . V. 58

Prison:—

Sanitary condition of the State Prison at Charlestown . . VI. 363

Mortality of prisons compared . . VI. 371

Death-rates according to the length of sentences . . VI. 373

Diet at Massachusetts State Prison, and in prisons of Great

Britain . . VI. 374

Air in the prison . . VI. 375

Privies:—

Privies of Boston tenement-houses . . IV. 400

Best kind of privies for tenement-houses . . IV. 401

How to build privy-vaults . . IV. 189

School-privies . . V. 438; IX. 234

Privies . . IV. 34; V. 455

Privies in the country . . V. 235

Points to be considered in construction of privies . . VII. 181

Hull privy . . VII. 182

Improved privy in use in some parts of the United States . VII. 185

Public privies . . VII. 456

Workmanship . . VII. 460

Effects of school-privies on health . . IX. 241

The ordinary privy should be abolished . . X. 301

Proctor's Brook:—	
Proctor's Brook in Peabody	VII. 224
Profession and trade:—	
Profession and trade of persons of consumptive tendencies	V. 51
Occupations	V. 473
Prostitution:—	
Syphilis and prostitution	X. xxvii
Purification:—	
Self-purification of streams	IV. 96
Purist theory:—	
Purist theory of sewage	VIII. 115
Race:—	
Races educated to intemperance	III. 81
Race affecting use of alcohol	III. 79
Railroad-cars:—	
Ventilation of railroad-cars	VI. 20, 225
Examination of air of railroad-cars	VI. 229
Methods of heating and ventilating cars	VI. 238
Ranney, Mark:—	
Accommodations for insane	VIII. 405
Rawlinson, Robert:—	
Some pollution of streams unavoidable	VIII. 62
Ray, Isaac:—	
Treatment of the insane	VIII. 348
Read, W.:—	
Communication to board of aldermen of consulting-physicians of Boston	II. 56
Reception-houses:—	
Reception-houses for families while their houses are being disin- fected after scarlet fever	IX. 314
Recreation:—	
Recreation by persons of consumptive tendencies	V. 48
Dancing	V. 55
Recreation of farmers	V. 245
Refuse materials:—	
Disposal of refuse materials	IV. 29, 30
Swill	IV. 29
Ashes	IV. 29, 30
Meat and vegetable refuse	IV. 30
House-offal	V. 465
Lynn	VIII. 197
Registration:—	
Registration of diseases	VI. 21; VII. 14, 475; VIII. 264
Holland	VIII. 266
Germany	VIII. 267
United States	VIII. 268

Registration — *Continued.*

Registration of deaths and of diseases	VIII. 12, 231
Registration of vital statistics	X. xxxviii; XI. 33
Analogy between registration and the signal service	VII. 478
Prevalent diseases of the various health districts for the year 1875, .	VII. 487
Circulars	VIII. 233; XI. 33
Information from physicians	VIII. 234
Information from town and city clerks	VIII. 248
History of registration of deaths	VIII. 258
Faults in our law	VIII. 261
Importance of registration	VIII. 264
Vital statistics	IX. xiii
A bill to provide for more accurate vital statistics	IX. xiii

Remedies:—

Remedies proposed with regard to slaughtering	I. 27
---	-------

Report:—

Reports of the Board, I. 1; II. 2; III. 2; IV. 2; V. 2; VI. 2;	
	VII. 2; VIII. 3; IX. VII; X. vii; XI. 5
Reports of secretary	I. 7; II. 19
Report on sale of poisons	I. 38
Report on slaughtering	I. 20
Time of making annual report	I. 7, 19
Report of the Butchers' Slaughtering and Melting Association,	
	IV. 443; VI. 187

Residence:—

Residence for persons of consumptive tendencies	V. 38
---	-------

Rice, W. E.:—

Case of poisoning by arsenic	III. 41
--	---------

Richardson, W. L.:—

Vote of thanks to Dr. W. L. Richardson	X. xlv
--	--------

Rinderpest:—

Rinderpest	VI. 160
----------------------	---------

Ringworm:—

Ringworm	III. 258
Modes of transmission	III. 292

Rivers:—

Sewage, what shall we do with it?	II. 233
Drainage to the rivers or sea	II. 233
Miller's River in East Cambridge and Somerville	III. 70
Miller's River commission	IV. 4
The pollution of streams	IV. 10, 19
River Irwell	IV. 94
River Tweed	IV. 95
Alleged self-purification of running streams	IV. 96
Blackstone River	IV. 82, 86, 88
Merrimac River	IV. 89, 90
Condition of certain English rivers	IV. 91

Rivers — *Continued.*

Case of Bradford, Eng.	IV. 92
Present condition of certain rivers in Massachusetts, water-supply of towns	V. 23, 61
Merrimac River	V. 64
Examination of Merrimac River	V. 70
Blackstone River	V. 82
Examination of Blackstone River	V. 83
Charles River	V. 90
Examination of Charles River	V. 92
Sudbury and Concord Rivers	V. 96
Examination of Sudbury and Concord Rivers	V. 98
Neponset River	V. 102
Examination of Neponset River	V. 103
Rivers as a source of water-supply	V. 103
Present condition of the water-supply of certain cities of Massachusetts	V. 111
Cochituate Lake, and its sources of supply	V. 111, 116
Mystic water.	V. 127
Examination of Mystic Lake	V. 130
Merrimac River as a source of water-supply	V. 132
J. M. Merrick's examination of Charles-river water	V. 152
Charles River as a source of water-supply	V. 142
Act to provide for an investigation of the question of the use of running streams as common sewers in relation to the public health	VII, 8, 23
Special report under the Act	VII. 8
The pollution of rivers, an examination of the basins of the Blackstone, Charles, Taunton, Neponset, and Chicopee Rivers, with general observations on water-supplies and sewerage	VII. 21
Statistics of the river-valleys	VII. 37
Blackstone River	VII. 73
Neponset River	VII. 89
Charles River	VII. 97
Chicopee River	VII. 109
Taunton River	VII. 123
Gaugings of several rivers of Massachusetts	VII. 142
General conclusions	VII. 144
The prevention of pollution	VII. 147
Little River, Haverhill	VII. 248
Pollution of water-courses or ponds	VII. 211
The pollution of streams, disposal of sewage, etc.	VIII. 6, 19
Nashua-river Basin	VIII. 21
Purification of polluted streams	VIII. 59
Some pollution unavoidable	VIII. 62
Testimony of Robert Rawlinson	VIII. 62

Rivers — *Continued.*

Propriety of legislation	VIII. 65
Nashua River beyond the State line	VIII. 67
Pollution of the Merrimac	VIII. 68
The Merrimac and other waters	VIII. 70
Effect of farming, percolation, etc.	VIII. 71
Legislation in England	VIII. 73
An Act for making further provision for the prevention of pollution of rivers in England	VIII. 73
Sewerage and the pollution of streams	IX. xv, 1
Sewage of the State Prison at Concord	IX. xviii
Circular	IX. 3
Hoosac and Housatonic Rivers	IX. 3
Pollution in the county	IX. 9
Housatonic Basin	IX. 9
Notes of E. K. Clark	IX. 9
Mills, factories, etc., in the Housatonic Basin	IX. 14
Summary of statistics for certain points on the Housatonic River,	IX. 19
General survey	IX. 20
Natural drainage	IX. 21
Relative mortality from consumption in the towns of the Housatonic Basin	IX. 23
Analysis of water from Pittsfield and Lee	IX. 25
The Hoosac Basin	IX. 28
Notes of E. K. Clark	IX. 28
Statistics of the Hoosac Basin	IX. 32
Examination of water from Hoosac River	IX. 36
Natural drainage	IX. 38
Circular	IX. 55
Pollution of streams	X. xxiii
Act relating to pollution of streams	X. xxiii
Rivers Pollution Commission : —	
General rules of the Rivers Pollution Commission, England	VII. 400
Roberts: —	
Roberts's Manual of Anthropometry	X. 58
Rochdale: —	
Rochdale pail-closet system	VII. 182
Rockport: —	
Water in lead pipes at Rockport	IV. 460
Rogers, T. L.: —	
Care of the insane	VIII. 373
Romford, Eng.: —	
Romford Sewage Farm	VII. 357
Rooms: —	
Room needed for meetings of the Board	I. 6, 19; VI. 22
Rothe, C. G.: —	
Letter on consumption	IV. 387

Rowing:—

Rowing by persons of consumptive tendencies V. 53

Rugby:—

Result of three years' experiments at the sewage-farm at Rugby, VII. 337

Runkle, J. D.:—

Formulæ on growth of children VIII. 310

Rush, Dr.:—

Dr. Rush on typhoid fever II. 171, 179

Responsibility of cities for conditions of disease . . . VIII. 136

Russia:—

Use of intoxicating liquors in Russia III. 103

Rye Beach:—

Intestinal disorder caused by impure ice VII. 14, 465

Salem:—

Tide-mills in Salem III. 68; VII. 257

Homes of the poor IV. 414

Removable causes of disease in Salem V. 538

Creek-street sewerage VI. 348

Sewerage of Salem VII. 257

North River VII. 258

Sanderson, Dr.:—

Investigations on intimate pathology of contagion . . . II. 91

Sanitary hints:—

Sanitary hints VII. 13, 409

Sanitary Acts of Great Britain VII. 28

Saugus:—

Examination of water from Saugus IX. 491

Sawmills:

Pollution of streams by sawmills VIII. 38

Sawyer, G. A.:—

George A. Sawyer v. State Board of Health X. ix

Opinions of Supreme Judicial Court X. ix, xv

Scarlet fever:—

Scarlet fever IX. xxvi, 253

Circular on scarlet fever IX. xxxii

Varying fatality of scarlet fever IX. 253

Mortality from scarlet fever IX. 257

Annual mortality from scarlet fever in Massachusetts, 1856-75 . IX. 261

Order of succession of ten principal diseases, 1870-75 . . IX. 262

Relation between deaths and cases of scarlet fever . . IX. 263

Relative fatality in Massachusetts IX. 265

Incomplete recoveries IX. 266

Scarlet fever a disease of the young IX. 268

Liability of the two sexes IX. 269

General distribution of scarlet fever IX. 270

Source and methods of contagion IX. 270

Scarlet fever — *Continued.*

Contagiousness	IX. 273
Review of testimony	IX. 282
Long periods of infecting power	IX. 283
Susceptibility to scarlet fever	IX. 286
General sanitary surroundings	IX. 288
Influence of schools, etc.	IX. 293
Incubative and infective period	IX. 297
Period of incubation	IX. 298
Duration of infective period	IX. 300
Summary of evidence	IX. 301
Restrictive measures	IX. 301
Disinfectants and deodorants	IX. 302
Methods of suppressing scarlet fever	IX. 304
Difficulties in complete disinfection	IX. 311
Hospitals for infectious diseases in Great Britain	IX. 312
Hospitals, etc., needed	IX. 315
J. S. Taylor on disinfecting establishment in Liverpool	IX. 317
Skilled inspectors needed	IX. 321
Popular education	IX. 322
Local boards of health	IX. 322
All classes and persons interested in restricting infection	IX. 324
Summary	IX. 325
Schaap, J. W.: —	
Liernur system	VII. 319
Schools: —	
Ventilation of schoolhouses	II. 14, 369; V. 434
Air of schoolrooms in Boston	II. 400
School hygiene	V. 25, 391
Circular	V. 395
The sexes in school	V. 397
Influence of puberty	V. 397
Osseous, respiratory, digestive, and nervous systems	V. 400
Chairs	V. 402
Eyesight	V. 404
Study in and out of school	V. 407
School sessions	V. 410
Article by A. C. Perkins	V. 411
Work and "worry"	V. 412
School-going compared with other occupations	V. 416
Half-time system	V. 418
Evidence from P. P. Carpenter	V. 421
Letter from G. H. Dunbar	V. 423
Letter from Gen. H. K. Oliver	V. 425
Modification of schools	V. 428
Privies	V. 438
Vacations	V. 439

Schools — *Continued.*

Number of pupils	V. 441
Women on school committees	V. 441
Properly constructed schoolhouses	V. 442
Physical exercises	V. 443
Location of buildings	V. 445
Sanitary inspection	V. 446; IX. xxiv, 227
Rules for preventing the spread of contagion in schools	IX. xxv, 252
Site	IX. 229
Ventilating, heating, and dryness	IX. 231
Cellars	IX. 233
Water-closets, etc.	IX. 234
Ill effects on health	IX. 241
Contagious diseases	IX. 243
Boston schools	IX. 247
Influence of schools in spreading scarlet fever	IX. 293
Schultz, J. S.:—	
Slaughtering cattle and preparing animal food	V. 170
Scilly Islands:—	
Disease in the Scilly Islands	I. 49
Scott, Adam:—	
Liernur system	VII. 313
Scott, H. Y. D.:—	
Scott's method of treating sewage	IV. 57
Secretary:—	
Reports of the secretary	I. 7; II. 19
Death of Dr. George Derby	VI. 2
Appointment of Dr. F. W. Draper as temporary secretary	VI. 4
Sewerage and sewage:—	
The sewage question	II. 233
Sewage, what shall we do with it? the earth-closet; irrigation of land; drainage to the rivers or sea	II. 233
Earth-closet	II. 235
Sewers of London	II. 238
Sewerage of the metropolitan district	IV. 6; V. 6
Sewerage and sewage, the pollution of streams, the water-supply of towns	IV. 10, 19
Water-carriage system	IV. 25
Sewage from other sources	IV. 28
Sewage	IV. 31
Sewers	IV. 36
Treatment of sewage	IV. 40
Composition of English sewage	IV. 43
Lime process	IV. 45
Blyth's process	IV. 46
Holden's process	IV. 46

Sewerage and sewage — *Continued.*

A B C process	IV. 47
Phosphate process	IV. 51
Process described by David Forbes	IV. 51
Sewage irrigation	IV. 55
Breton Farm	IV. 56
Treatment and utilization of sewage in Massachusetts	IV. 61
Examination of Boston sewage	IV. 65, 70
Sewage of Worcester	IV. 74
Examination of Worcester sewage	IV. 77
River Irwell	IV. 94
River Tweed	IV. 95
Alleged self-purification of running streams	IV. 96
The effect of sewage and manufacturing refuse on running streams	IV. 81
Blackstone River	IV. 82, 86
Mill Brook, Worcester	IV. 83, 84
Examination of Blackstone River	IV. 88
Merrimac River at Lowell	IV. 89
Examination of Merrimac River	IV. 90
Condition of certain English rivers	IV. 91
Case of Bradford, Eng.	IV. 92
The opportunity and possibility of utilizing the sewage of Worces- ter	IV. 109
Scott's method of treating sewage	IV. 57
Existing state of the law concerning water-supply fouled by sew- age	V. 125
Sewage and water-supply	V. 105
Dangers	V. 106
Special disease propagated by sewage	V. 108
Drinking-water should be absolutely free from sewage	V. 107
Sewerage of Miller's River district	V. 16
Sewerage of Paris	V. 177
Drains and sewers	VI. 5
The pollution of rivers, with general observations on water-sup- plies and sewerage	VII. 8, 21
Drainage and sewerage	VII. 150
The water-supply, drainage, and sewerage of the State from the sanitary point of view	VII. 175
Excrement removal	VII. 180
Methods employed in Great Britain	VII. 181
Water-supply and sewerage	VII. 193
Outlets of sewers	VII. 202
Lists of cities and towns showing disposition of sewage	VII. 202
Is such sewage offensive ?	VII. 205
Pollution of well or other sources of water-supply	VII. 208
Pollution of water-courses or ponds	VII. 211

Sewerage and sewage — *Continued.*

Covered stream used as a sewer in Wakefield	VII. 221
Proctor's Brook in Peabody	VII. 224
Sewer in Chicopee	VII. 226
Sewage of one town polluting air or water of another	VII. 228
Water-supply and sewerage of Boston	VII. 232
Water-supply and sewerage of Chicopee	VII. 246
Sewerage of Fall River	VII. 247
Haverhill	VII. 248
Lynn	VII. 249
Salem	VII. 257
Water-supply and sewerage of Worcester	VII. 264
Extracts from report of C. H. M. Blake	VII. 265
The disposal of sewage	VII. 276
The effects of filth on health	VII. 278
The influence of sewer-gases on health	VII. 281
Water contaminated by sewage	VII. 283
Experience in England	VII. 285
Sewage question in England	VII. 289
Substitutes for the water-carriage system	VII. 299
Sewerage in France, Germany, and Holland	VII. 302, 307, 311
Processes for purifying sewage	VII. 323
Deodorization	VII. 323
Filtration	VII. 324
Intermittent downward filtration	VII. 325
Precipitation	VII. 326
Lime process	VII. 328
Albumina process	VII. 330
Superphosphate process	VII. 331
Sulphite of lime and magnesia process	VII. 331
A B C process	VII. 331
Precipitation by metallic salts	VII. 332
Suvern's system	VII. 332
Lenk's process	VII. 333
Irrigation	VII. 334
Subsoil irrigation	VII. 334
Surface irrigation	VII. 335
Result of three years' experiments at the sewage-farm in	
Rugby	VII. 337
Effect of sewage-grass on milk of cows	VII. 338, 344
The mode of distributing sewage	VII. 340
Location of sewage-farms	VII. 341
Amount of land necessary	VII. 342
The effect of climate	VII. 342
Theory of the purification of sewage	VII. 343
The effluent from sewage-farms	VII. 343
Alleged ill effects	VII. 344

Sewerage and sewage — *Continued.*

The cost of irrigation	VII. 345
Methods of disposing of sewage	VII. 347
Manchester, Eng.	VII. 347
Leeds	VII. 348
Birmingham	VII. 349
Coventry	VII. 352
Edinburgh	VII. 354
West Derby	VII. 356
Crewe	VII. 357
Romford	VII. 357
Croydon	VII. 358
Breton Sewage Farm	VII. 360, 370, 371
Bedford	VII. 378
Accounts of Bedford Irrigation Farm	VII. 379
Tunbridge Wells	VII. 383
Leamington	VII. 385
Merthyr Tydfil, Wales	VII. 387
Analyses by Edward Frankland	VII. 389
Gennevilliers, France	VII. 390
Dantzic, Germany	VII. 393
Durham-county Insane Asylum, England	VII. 395
Augusta, Me.	VII. 395
Waste of sewage	VII. 397
Conditions of sewage-farming	VII. 399
General rules of Rivers Pollution Commission, England	VII. 400
Summary and recommendations	VII. 402
Disposal of sewage	VIII. 6, 19; X. xx
Sewerage	VIII. 11
Disposal of sewage in the Nashua Basin	VIII. 64
Propriety of legislation	VIII. 65
The disposal of sewage	VIII. 80
Irrigation	VIII. 80
Experiments in Massachusetts	VIII. 80
Progress elsewhere	VIII. 81
Glasgow	VIII. 81
Liernur system	VIII. 82
Precipitating processes	VIII. 82
Coventry	VIII. 82
Leeds	VIII. 83, 84
Hill's process	VIII. 85
Dry removal	VIII. 87
Opinions of experts	VIII. 88
English Government statistics	VIII. 90
Overflow of sewage on land	VIII. 90
Filtration	VIII. 91
Simple subsidence	VIII. 91

Sewerage and sewage, English Government statistics — *Continued.*

Subsidence and filtration	VIII. 92
Irrigation	VIII. 92
Intermittent downward filtration	VIII. 95
Precipitation	VIII. 95
Precipitation and filtration	VIII. 97
Cost of precipitation	VIII. 97
Cost of irrigation	VIII. 98
Cost of Barking Farm	VIII. 99
Cost of Cheltenham Farm	VIII. 99
Cost of Bedford Farm	VIII. 101
Cost of dry removal	VIII. 101
Cost of no removal of sewage	VIII. 102
Conclusions of English Government Board	VIII. 102
Experience in Germany	VIII. 104
Austria	VIII. 105
France	VIII. 105
Objections to irrigation below Paris	VIII. 105
Sewage of Paris	VIII. 106
Irrigation with the sewage of Paris	VIII. 106
Intercepting sewer and deep-sea outlet	VIII. 107
Precipitation	VIII. 107
Present condition, objections, etc.	VIII. 108
Letter from Alfred Durand-Claye	VIII. 109
Some objections to sewage irrigation considered	VIII. 112
Effects on health of bad drainage	VIII. 113
Sources of disease	VIII. 114
Contaminated water	VIII. 114
Opinion of Alfred Carpenter	VIII. 114
The purist theory	VIII. 115
Contaminated air and soil	VIII. 116
Oxidation of sewage	VIII. 117
Filth not safe	VIII. 118
Specific poison theory	VIII. 118
Illustrations from poisoned air	VIII. 118
Croydon	VIII. 119
Fever at Fort Cumberland	VIII. 120
Fever at Uppingham School	VIII. 120
Composition of sewer-gas	VIII. 121
Polluted water	VIII. 122
Sewerage regulations at Frankfort-on-the-Main	VIII. 130
Sewerage, its advantages and disadvantages, construction, and maintenance	VIII. 11, 157
Surveys	VIII. 143
Preliminary study	VIII. 143
What should be admitted into the sewers	VIII. 149
Soil-water	VIII. 150

Sewerage and sewage — *Continued.*

Flooding cellars, etc.	VIII. 150
Sizes of sewers	VIII. 151
Forms of sewers	VIII. 155
Material and thickness of sewers	VIII. 155
Depth of sewers	VIII. 158
Double system of sewers	VIII. 159
Access to sewers	VIII. 159
Brauchies and junctions	VIII. 160
House-drainage	VIII. 160
Supply of water	VIII. 161
Flushing	VIII. 161
Ventilation of sewers	VIII. 163
Contracts, specifications, and inspection	VIII. 164
Maintenance of sewers	VIII. 165
Records	VIII. 166
Disadvantages considered	VIII. 166
Sewerage of Lynn	VIII. 190
Drainage, sewerage, and the pollution of streams	IX. xv, 1
Act concerning the sewage of the State Prison at Concord	IX. xviii
Circular on sewerage of Hoosac and Housatonic Rivers	IX. 3
Replies from correspondents	IX. 4
Hoosac and Housatonic Rivers	IX. 3
Water-supply and sewerage	IX. 8
Housatonic Basin	IX. 9
Notes of E. K. Clark	IX. 9
Mills, factories, etc., in the Housatonic Basin	IX. 14
Summary of statistics for certain points on the Housatonic River,	IX. 19
France	IX. 70
Germany	IX. 70
Massachusetts	IX. 71
Recommendations	IX. 77
Necessity of supervision	IX. 80
Natural drainage	IX. 21
Hoosac Basin	IX. 28
Notes of E. K. Clark	IX. 28
Statistics of the Hoosac Basin	IX. 32
Natural drainage	IX. 38
Diphtheria and drainage	IX. 38
Circular	IX. 55
Replies from manufacturers	IX. 56
Summary and draft of a law	IX. 66
English experience	IX. 67
Conference on health and the sewage of towns in London	IX. 69
Sewerage of Cambridge	IX. 347
Disposal of sewage in Europe	X. xxi

See also "Drainage."

Sewer-gases: —

The influence of sewer-gases on health VII. 281

Sewing-machines: —

Sewing-machines II. 16

Effects on health when moved by foot-power III. 8, 179

History III. 180

Saving of time and labor III. 183

Alleged ill effects III. 183

Investigations by Dr. Decaisne III. 187

Effects on health in Massachusetts III. 188

Opinions of physicians III. 189

Operatives and employers III. 199

Remedies III. 215

New attachments III. 216

Tirrell's electro-magnetic motor III. 216

Parsons's treadle III. 217

Hall's treadle III. 218

General conclusions III. 221

Shaker communities: —

Typhoid fever in Shaker communities II. 161

Sharples, S. P.: —

Analysis of water and ice at Cambridge X. 119

Impurity in certain wells in Eastern Massachusetts . . IV. 101; VI. 300

Sheep: —

Transportation of sheep VI. 109

Parasites affecting sheep VI. 157

Shelley: —

Cremation of the poet Shelley VI. 252

Sheppard, Edgar: —

Care of the insane VIII. 386, 388

Shew, A. M.: —

Care of the insane VIII. 385

Shoddy-mills: —

Pollution of streams by shoddy-mills VIII. 38

Siemens: —

Siemens's method of cremation VI. 258

Silk: —

Pollution of rivers by silk manufacture VII. 49

Simpson, J. Y.: —

Hospitalism V. 320

Skin: —

Care of the skin by persons of consumptive tendencies . . V. 46

Slaughtering: —

Slaughtering for the Boston market I. 3, 20

Number of animals slaughtered I. 20

Report of Dr. H. G. Clark on Brighton in 1866 I. 21

Slaughter-house piggeries I. 23

Slaughtering — *Continued.*

The remedies	I. 27
Value of blood	I. 29, 33
Need of abattoirs	I. 31
Blood-albumen, its value and mode of production	I. 33
Abattoir of Paris	I. 36
Doings under the law concerning slaughter-houses and noxious and offensive trades	III. 2
Concerning slaughter-houses and noxious and offensive trades, III. 2, 229; IV. 7; V. 6; VI. 8, 197, 200; VII. 2; VIII. 3; IX. vii; X. vii; XI. 5	
Cases of alleged violation of the law submitted to the Board	III. 2
Vote concerning prosecution of persons maintaining nuisances	III. 4
The Brighton butchers and the proposed abattoir	III. 5
Slaughtering, bone-boiling, and fat-melting	III. 5, 223
Act to incorporate the Butchers' Slaughtering and Melting As- sociation	III. 227; VI. 197
Conference with butchers	III. 231
Remarks of Dr. Bowditch	III. 231
Report of committee of butchers on New-York slaughter-houses,	III. 233
Proposition of the butchers	III. 235
Objections to the proposition	III. 238
Butchers accept Act to incorporate the association	III. 240
Butchers' Slaughtering and Melting Association	IV. 9; V. 158
Reports of the Butchers' Slaughtering and Melting Association, IV. 443; V. 443; VI. 187	
Regulations	VI. 190
Act concerning swine-slaughtering associations	VI. 200
Miller's River in Cambridge and Somerville	V. 8
Correspondence with Charlestown officials	V. 10
Report of Board of Health of Somerville	V. 11
Reply of the Board of Health	V. 12
Address of chairman of Board to persons complained of	V. 14
Brighton Abattoir	V. 20, 153; VI. 15, 19
Letter of J. S. Schultz.	V. 170
Description of Brighton Abattoir	V. 164
Slaughter-houses, melting and rendering factories	V. 469
Complaints against parties maintaining nuisances	VI. 11
Rules for the management of slaughter-houses	VI. 180
Slaughtering-mask	VI. 181
The abattoir and the slaughter-houses in Brighton	VII. 4
Notice to slaughterers and renderers	VII. 6
Complaints under the law concerning Bridgewater	IX. xi
Cambridge	IX. xi
Watertown	IX. x
Weymouth.	IX. xii
Woburn	IX. xii

Slaughtering — *Continued.*

Case George A. Sawyer <i>v.</i> State Board of Health	X. ix
Bradley Fertilizer Company	X. xviii
City of Cambridge <i>v.</i> Niles Brothers	X. xviii, 111; XI. 5

Small-pox:—

Small-pox in Massachusetts	II. 6; III. 9, 297; IV. 2, 468; V. 2, 481
Death from small-pox in twenty-eight years	III. 298
Isolation	III. 304
Deficiency of law	III. 9, 304
Small-pox in Ireland	II. 7
Circular on vaccination	III. 299

Smith, Angus:—

Carbonic acid found in the open air in England	II. 405
--	---------

Smith, Nathan:—

Dr. Nathan Smith on typhoid fever	II. 163
---	---------

Smith, R. A.:—

Carbonic acid found in the open air in England	II. 398, 405
--	--------------

Snuff:—

Snuff-dipping in Clinton	IX. 399
------------------------------------	---------

Société Industrielle:—

Société Industrielle de Mulhouse	I. 33
--	-------

Soil-moisture:—

Soil-moisture as a cause of consumption	I. 46
Soil-water	VIII. 150

Somerville:—

Miller's River in East Cambridge and Somerville . . .	III. 70; V. 11, 12
---	--------------------

South Adams:—

Topography of, and disease in, South Adams	IX. 46
--	--------

South Braintree:—

Little Pond in South Braintree	VI. 17; VII. 261
--	------------------

South Framingham:—

Insanitary condition of camp at South Framingham . .	VII. 549
--	----------

Spectacle Island:—

Dead animals carried to Spectacle Island	I. 26
--	-------

Springfield:—

Homes of the poor	IV. 419
Water-supply at Springfield	IV. 460; VII. 271
Ludlow Reservoir	VII. 271, 273
Experiments on water-supply at Springfield	IX. 168
Examination of water from Springfield	IX. 171

Spy Pond:—

Spy Pond	IX. 343
--------------------	---------

State:—

The value of health to the State	VI. 18, 55
--	------------

State medicine:—

State medicine in Massachusetts	I. 1, 9
Dr. Farr on State medicine	I. 10

Stearns, H. P.:—

Care of the insane	VIII. 381
------------------------------	-----------

Stuart, R. S.:—

Disposal of excrement.	VII. 186
--------------------------------	----------

Stock-yards:—

Boston live-stock market	VI. 110
Quality of beef cattle	VI. 118
Stock-yards	VI. 120
Union Stock-yards, Chicago	VI. 121
Buffalo Stock-yards	VI. 126
Albany Stock-yards	VI. 127
Stock-yards at Brighton	VI. 129
Union Stock-yards, Watertown	VI. 130

Stodder, C.:—

Microscopic examination of dust	II. 405
---	---------

Streams:—

The pollution of streams	IV. 10, 19
River Irwell	IV. 94
River Tweed	IV. 95
Alleged self-purification of running streams	IV. 96
The effect of sewerage and manufacturing refuse on running streams	IV. 81
Blackstone River	IV. 82, 86
Mill Brook, Worcester	IV. 83, 84
Examination of Blackstone River	IV. 88
Merrimac River at Lowell	IV. 89
Examination of Merrimac River	IV. 90
Condition of certain English rivers	IV. 91
Case of Bradford, Eng.	IV. 92
Act to provide for an investigation of the question of the use of running streams as common sewers in relation to the public health	VII. 8, 23
Special report under the Act	VII. 8
The pollution of rivers, an examination of the water-basins of the Blackstone, Charles, Taunton, Neponset, and Chicopee Rivers, with general observations on water-supplies and sewerage	VII. 21
Statistics of the river-valleys	VII. 37
Gaugings of several rivers of Massachusetts	VII. 142
The prevention of pollution	VII. 147
Pollution of wells or other sources of water-supply	VII. 208
Pollution of water-courses or ponds	VII. 211
Covered stream used as a sewer in Wakefield	VII. 221
Proctor's Brook in Peabody	VII. 224
The pollution of streams, disposal of sewage, etc.	VIII. 6, 19
Nashua-river Basin	VIII. 21
Population of towns in Nashua Basin	VIII. 23

Streams — *Continued.*

Statistics of Nashua River	VIII. 25
Summary of statistics	VIII. 34
Pollution from mills	VIII. 35
E. K. Clark's account of Nashua River	VIII. 38
Summary of survey	VIII. 46
Analysis of waters	VIII. 48, 52, 56
Purification of polluted streams	VIII. 59
Pollution of the Nashua	VIII. 61
Some pollution unavoidable	VIII. 62
Testimony of Robert Rawlinson	VIII. 62
Disposal of sewage in the Nashua Basin	VIII. 64
Propriety of legislation	VIII. 65
Nashua River beyond the State line	VIII. 67
Pollution of the Merrimac	VIII. 68
The Merrimac and other waters	VIII. 70
Effect of farming, percolation, etc.	VIII. 71
Legislation in England	VIII. 73
Sewerage and the pollution of streams	IX. xv, 1
Circular	IX. 3
Hoosac and Housatonic Rivers	IX. 3
Housatonic Basin	IX. 9
Notes of E. K. Clark	IX. 9
Mills, factories, etc., in the Housatonic Basin	IX. 14
Summary of statistics for certain points on the Housatonic River,	IX. 19
General survey	IX. 20
Natural drainage	IX. 21
Analysis of water from Pittsfield and Lee	IX. 25
Hoosac Basin	IX. 28
Notes of E. K. Clark	IX. 28
Statistics of the Hoosac Basin	IX. 32
Examination of water from Hoosac River	IX. 36
Natural drainage	IX. 38
A bill to prevent the pollution of streams, and for other purposes,	IX. 73
Pollution of streams	X. xxiii
Act relating to pollution of streams	X. xxiii
Streets:—	
Want of clean streets in Boston	II. 5
Sudbury River:—	
Sudbury and Concord Rivers	V. 96, 125
Examination of Sudbury and Concord Rivers	V. 98
Sudbury River	VII. 234
Sugar-refiners:—	
Use of blood by sugar-refiners	I. 30
Sulphite of lime process:—	
Sulphite of lime and magnesia process of treating sewage	VII. 331
Superphosphate process:—	
Superphosphate process of treating sewage	VII. 331

Suvern:—

Suvern's process of treating sewage VII. 332

Swallow, Ellen H.:—

Analyses IV. 108

Sweden:—

Use of intoxicating liquors in Sweden . . . III. 121, 122, 129

Swill:—

Disposal of swill IV. 29

Swimming:—

Swimming by persons of consumptive tendencies . . . V. 58

Swine:—

Act concerning swine-slaughtering associations . . . VI. 200

Transportation of swine VI. 107

Swine-slaughtering in Miller's River district . . . V. 17

Syphilis:—

Syphilis and prostitution X. xxvi

Tanks:—

Tanks should not be used for drinking-water . . . VII. 441

Tape-worm:—

Tape-worm described VI. 142

Destroyed by thorough cooking VI. 145

Introduction and source in man VI. 143

Measly pork VI. 145

Tartaric acid:—

Tartaric acid as a substitute for fruit . . . IV. 169

Taunton:—

Polluted wells in Taunton IX. 487

Examination of water from Taunton . . . IX. 200, 202

Taunton River:—

Examination of the water-basin of Taunton River . . VII. 21, 123

River statistics, mills, factories, etc. . . . VII. 124

Notes of F. L. Fuller VII. 136

L. S. Drake on iron-works at Easton . . . VII. 137

Condensed statistics of the Taunton-river Valley . . VII. 139

Analysis of water VII. 140, 141, 156, 168

Taylor, J. S.:—

Disinfecting establishment in Liverpool . . . IX. 317

Tea:—

Tea as a stimulant III. 104, 129

Tea and coffee IV. 270

Teachers:—

Teachers should have fewer pupils V. 441

Teeth:—

Cause of decayed teeth VI. 359

Tenement:—

Model lodging-houses and common tenements . . I. 4; II. 218

Tenement — *Continued.*

Overcrowding of tenement-houses and want of clean streets in	
Boston	II. 5
Houses for the people	II. 181
Night inspection of tenement-houses of London and Boston .	II. 183
The Peabody Buildings	II. 194
Miss Burdett-Coutts's market-house, lodging-house, and reading-room at Columbia Square	II. 199
The Improved Industrial Dwelling Company	II. 201
Jarrow Building Company	II. 210
Model lodging-house and common tenement compared . .	II. 218
Model lodging-house in Osborn Place, Boston	II. 219
Common tenement-house, or Crystal Palace so called . . .	II. 220
Model lodging and low tenement houses	III. 10
Boston Co-operative Building Association	III. 11
Crystal Palace, or Lincoln Building	III. 11; IV. 432
Tenements, schools, public buildings	V. 474
Tewksbury:—	
Drainage of Tewksbury Almshouse	IV. 185
Texas:—	
Texas cattle disease	VI. 163
Thompson:—	
Sir Henry Thompson's method of cremation	VI. 263
Thorne, Dr.:—	
Foot and mouth disease in cattle	II. 4
Three Rivers, C.E.:—	
Illustration of soil-poisoning from privies	VII. 185
Tide-mills:—	
Tide-mills	III. 67
Tinea:—	
Tinea tonsurans	III. 258, 278, 289
Tirrell:—	
Tirrell's electro-magnetic motor for sewing-machines . . .	III. 216
Tobacco:—	
Tobacco as a stimulant	III. 104
Composition of tobacco-smoke	VI. 230
Toledo:—	
Filtering-works at Toledo, O.	IX. 151
Total abstinence:—	
Will total abstinence ever prevail universally?	III. 107
Towns:—	
Health of towns:—	
Abington	IV. 450; IX. 377; X. 291
Acton	III. 306; IX. 377
Acushnet	II. 54; VIII. 465
Adams	VIII. 465; X. 280, 291
Alford	VI. 332

Towns, Health of towns — *Continued.*

Amesbury	II. 54; IV. 450; V. 515; VII. 534; IX. 377
Amherst, III. 307; IV. 450; V. 515; VI. 332; VII. 534; VIII. 465; X. 280	
Andover	VI. 333; VIII. 465; IX. 378
Arlington	VI. 333; VII. 535; VIII. 460
Ashburnham	V. 515; VI. 333, 466; VII. 535; IX. 378
Ashby	VI. 333; VII. 535; VIII. 466; IX. 379
Ashland	II. 55; VI. 333; VIII. 466
Athol	II. 55; V. 515; VI. 333; IX. 379
Attleborough	II. 54; III. 306; IV. 450; V. 515; VI. 334; VII. 535; VIII. 467; IX. 379
Auburn	IX. 380
Ayer	III. 307; V. 516; VIII. 467; IX. 381; X. 291
Barnstable	II. 62; IV. 451; VI. 334; VII. 535; VIII. 468; IX. 380
Barre	II. 62; IX. 381
Becket	III. 310; VI. 334; VIII. 468; IX. 382
Bedford	VII. 535; X. 280
Belchertown	III. 310; V. 517; VII. 535; IX. 382; X. 280
Bellingham	VIII. 468; IX. 383
Belmont	VI. 334
Berkley, II. 63; III. 310; V. 516; VI. 334; VII. 535; VIII. 468; IX. 384	
Berlin	IX. 384; X. 280
Bernardston	IX. 384
Beverly	IV. 451; V. 516; VII. 535; VIII. 469; IX. 384
BillERICA	II. 62; IX. 385
Blackstone	II. 62; IV. 451; VII. 537; IX. 385
Blandford	VII. 537
Boston, II. 55; III. 10, 307; IV. 450; V. 516; VI. 334; VII. 493; VIII. 469; IX. 385; X. 284, 289	
Boxborough	IX. 394; X. 280, 292
Braintree	VIII. 474; IX. 395; X. 280
Brewster	VII. 537; IX. 395
Bridgewater	IX. 395
Brighton	I. 24; VI. 338; VII. 537
Brimfield, II. 55; III. 310; V. 516; VI. 339; VII. 537; VIII. 474; IX. 395; X. 280	
Brockton	VIII. 474; IX. 396; X. 280
Brookfield	V. 517; VII. 537; X. 292
Brookline	II. 62; IV. 452; VIII. 474
Buckland	VIII. 474; IX. 397
Cambridge	IV. 453; V. 517; VII. 537; IX. 397
Canton	III. 310
Carver	III. 314; X. 292
Charlemont	VII. 537
Charlestown	III. 314; IV. 453; VI. 339; VII. 537
Chelsea	V. 517; VI. 341; VII. 538; IX. 398; X. 280, 292
Cheshire	III. 314; V. 517

Towns, Health of towns — *Continued.*

Chester	IX. 398; X. 292
Chicopee	II. 65; III. 315; IV. 452; V. 517
Chilmark	VII. 538; IX. 398
Clinton	III. 310; IV. 453; V. 518; VI. 341; VII. 538; IX. 398
Colrain	II. 65; III. 314; VI. 341; IX. 399
Concord	II. 63; IX. 399
Conway	III. 314; VI. 341; VIII. 474; IX. 400
Dalton	IX. 400
Dana	IX. 400
Danvers	III. 315; IV. 454; IX. 400
Dartmouth	VII. 538
Dedham	III. 315; IV. 454; V. 1 58; VI. 342
Dennis	II. 65; VII. 538; VIII. 474
Dorchester	V. 518
Douglas	VI. 342; IX. 401
Dover	VI. 343; VII. 538
Dracut	VI. 343
Dudley	II. 66; III. 315; VI. 343; IX. 402
East Bridgewater	VIII. 474
East Boston	VI. 335; VII. 538
Eastham	III. 315; VIII. 475; IX. 402
Easthampton	III. 315; V. 518; VIII. 475; IX. 402
Easton	VIII. 475; IX. 402
Enfield	VIII. 476; IX. 402
Essex	II. 66; V. 519; IX. 403
Everett	III. 315; V. 519; VI. 343; VIII. 476; IX. 404; X. 292
Fairhaven	III. 316; V. 519; VIII. 476; IX. 404; X. 292
Fall River	II. 66; III. 316; IV. 454; V. 519; VIII. 476; IX. 404
Falmouth	II. 66; III. 316; VII. 538; IX. 405
Fitchburg, II. 66; III. 316; IV. 455; V. 519; VI. 343; VII. 539;	
	VIII. 476; IX. 405; X. 292
Florida	VI. 343; IX. 406
Foxborough	V. 520; VIII. 478; IX. 406; X. 280
Framingham	IV. 454; VII. 549; VIII. 478
Gardner	IX. 406; X. 281, 293
Georgetown	IX. 407
Gloucester	II. 66; III. 317; IV. 455; VII. 539; IX. 407
Grafton	IV. 456; VI. 343
Granby	III. 317; VI. 343; VIII. 478; IX. 408
Granville	IX. 408
Great Barrington	IV. 455; VI. 343; VII. 539; IX. 409
Greenwich	VI. 343
Groton	II. 67; IX. 409
Groveland	II. 66; V. 520; IX. 410; X. 293
Hadley	II. 68; III. 317; V. 520; VII. 539; IX. 410; X. 281
Halifax	III. 317; VIII. 478

Towns, Health of towns — *Continued.*

Hancock	IX. 411
Hanover	VIII. 478; IX. 411; X. 281
Hanson	II. 67; III. 317; VII. 539; VIII. 479; IX. 412
Hardwick	VII. 539
Harwich	VIII. 479
Hatfield	VII. 539
Haverhill	IV. 456; V. 520; VI. 343; VII. 540; VIII. 479; IX. 412; X. 293
Hawley	IX. 413
Heath	VII. 540
Hingham	II. 67; IV. 456; V. 521; VI. 343; VIII. 480; IX. 413; X. 281
Hinsdale	II. 67; V. 521
Holliston	VIII. 480
Holmes's Holl	II. 67
Holyoke	IV. 456; VI. 344; VII. 540; VIII. 480; IX. 413
Hopkinton	III. 317; IV. 456; V. 521; VI. 344
Hubbardston	II. 68
Hudson	II. 68; VII. 540; VIII. 480
Hull	IX. 414
Huntington	III. 317; VIII. 480; IX. 415; X. 293
Hyde Park	IV. 456; V. 521; VII. 540; VIII. 481; IX. 415
Kingston	VIII. 481; IX. 415
Lancaster	VI. 345; VIII. 482; IX. 416
Lanesborough	III. 318
Lawrence	IV. 456; V. 521; VI. 345; VII. 540; VIII. 482; IX. 416
Lee	V. 523; IX. 418
Leicester	VI. 345; VII. 540
Lerox	II. 69; VI. 345; IX. 419
Leominster	II. 68; VI. 345; VIII. 483; IX. 419
Leverett	III. 318; V. 524; VI. 345; IX. 420
Leyden	III. 318
Lexington	II. 69; V. 524; IX. 421; X. 281
Lincoln	III. 318; V. 524; VI. 345; IX. 421
Littleton	II. 69; III. 318; VII. 541; IX. 421
Longmeadow	III. 318
Lowell	V. 524; VI. 345; VII. 515, 546, 547; IX. 421
Lunenburg	II. 68; IX. 422
Lynn	II. 69; IV. 456; V. 526; VI. 347; IX. 423; X. 293
Malden	III. 318; VI. 347; VII. 541; VIII. 484; IX. 424
Manchester	VIII. 484
Marblehead	IV. 457; V. 526; VI. 347; VIII. 484; IX. 425
Marlborough	IV. 457; V. 295; VIII. 484; IX. 425; X. 295
Marshfield	VII. 541
Mashpee	IX. 426
Mattapoisett	III. 319; IX. 426; X. 295
Maynard	IX. 426

Towns, Health of towns — *Continued.*

Medfield	VIII. 484; IX. 426
Medford	V. 527
Medway	V. 531; IX. 426
Melrose	IX. 427
Mendon	IX. 427
Middleton	II. 70; IX. 427
Milbury	V. 531; VI. 347; IX. 428; X. 294
Milford	IV. 457; IX. 427
Milton	V. 531
Monroe	IX. 428
Mouson	V. 531; IX. 428
Montague	III. 319; V. 531; VI. 347; VII. 541; IX. 429
Montgomery	IX. 429
Mount Washington	IX. 429
Nahant	II. 71; III. 319
Nantucket	II. 71; VII. 541; VIII. 485; IX. 429
Natick	IV. 457; VI. 347; VII. 541; VIII. 485; IX. 430; X. 281
Needham	VI. 347; VII. 541
New Bedford	IV. 457; V. 531; VIII. 485; IX. 431
Newbury	X. 295
Newburyport	III. 319; IV. 457; V. 532; VI. 347; VIII. 485; IX. 431; X. 281
New Marlborough	IX. 431
New Salem	II. 72; IX. 432
Newton	II. 71, 72; IV. 457; VII. 541, 542; IX. 432; X. 295
North Adams	II. 71; IV. 458; V. 532; VI. 347; VII. 542; IX. 432
Northampton	IX. 433; X. 296
North Andover	V. 532; VIII. 485; IX. 433
Northborough	II. 71; IX. 433
Northbridge	V. 532
North Bridgewater	V. 532
Northfield	V. 532; VIII. 486
North Prescott	II. 72; V. 533
North Reading	VI. 348; VII. 542; IX. 434; X. 281
Norwood	IX. 434
Orange	VII. 542
Orleans	II. 72; III. 319; VII. 542; IX. 434; X. 296
Otis	VI. 348
Oxford	V. 534; IX. 435; X. 281
Palmer	VI. 348; IX. 435
Peabody	IV. 458; VII. 543
Pelham	IX. 436
Pembroke	III. 322; VII. 543; IX. 436; X. 296
Pepperell	VII. 543; VIII. 486; IX. 436
Peru	VI. 348
Petersham	IX. 436

Towns, Health of towns — *Continued.*

Pittsfield	II. 72; III. 320; IV. 458; V. 534; VII. 543; VIII. 486; IX. 437
Plymouth	II. 72; IV. 458; IX. 437; X. 296
Plympton	III. 322; VIII. 487; IX. 438
Prescott	III. 313
Princeton	VIII. 487; IX. 438; X. 281
Provincetown	II. 72; V. 537
Quincy	III. 322; V. 537; VI. 348
Randolph	II. 72; VI. 348; VIII. 488; IX. 438
Raynham	VI. 348; IX. 438
Reading	II. 73; V. 538; VI. 348; VIII. 488; IX. 438; X. 296
Revere	X. 297
Rehoboth	II. 75; IX. 440
Rochester	III. 322; IX. 440
Rockland	VIII. 488; IX. 440
Rockport	II. 73; IV. 460; VIII. 488; IX. 441; X. 281
Rowe	IX. 441
Rowley	IX. 441
Royalston	VII. 543
Russell	IX. 441
Salem	II. 78; IV. 463; V. 538; VI. 348; VII. 543
Salisbury	VIII. 489; IX. 442
Saugus	VII. 544; VIII. 489
Savoy	IX. 442
Seekonk	VI. 354; IX. 442
Sharon	IX. 443
Sheffield	III. 324
Shelburne	V. 540; VI. 354; VII. 544; IX. 443; X. 281
Sherborn	VIII. 489; IX. 443
Shirley	III. 324
Shrewsbury	II. 78; III. 324; VIII. 489
Somerset	III. 325; V. 540; IX. 444
Somerville	II. 77; III. 325; VI. 354; VIII. 489
South Abington	IX. 444
Southampton	II. 76; IX. 444
Southbridge	III. 322; IV. 463; V. 540; IX. 445; X. 281
South Dennis	V. 541; VI. 355; VIII. 494
South Hadley	II. 76; V. 541; IX. 445
South Hadley Falls	VII. 544; IX. 445
South Scituate	V. 542; IX. 446
Southwick	V. 542; VII. 544
Spencer	V. 542; IX. 446
Springfield	IV. 460; V. 545; VII. 544; VIII. 489; IX. 446
Sterling	VI. 355; IX. 446; X. 298
Stockbridge	II. 77; V. 545; IX. 447
Stoneham	II. 78; III. 325; IV. 460; V. 546; VI. 355; VII. 545; VIII. 490; IX. 447

Towns, Health of towns—*Continued.*

Stoughton	II. 76; IV. 463; V. 546
Stow	II. 76; IX. 447
Sturbridge	VIII. 490; IX. 448
Sudbury	IX. 448
Sunderland	IX. 448
Sutton	II. 78; IX. 449; X. 298
Swampscott	III. 325; IX. 449
Swansea	V. 546; IX. 449
Taunton	II. 79; VII. 545; IX. 449; X. 281, 298
Tewksbury	V. 546; IX. 450
Tisbury	II. 80; IX. 450; X. 281
Topsfield	II. 80; V. 546; VI. 355; IX. 450
Truro	II. 80; IX. 450
Tyngsborough	IX. 450
Upton	II. 83; III. 326; V. 546; VI. 355; VIII. 490; IX. 450
Uxbridge	VI. 356; VIII. 490; IX. 451
Wakefield	II. 81; IV. 463; VI. 356; VII. 545; IX. 451; X. 282, 298
Wales	VIII. 490; IX. 452
Walpole	II. 82; III. 325; V. 547; IX. 453; X. 282
Waltham	II. 82; IV. 463; VI. 356; VIII. 491; IX. 453
Ware	V. 547; VIII. 491; IX. 453
Wareham	VII. 545; IX. 453
Warren	V. 547; VIII. 491; IX. 454
Warwick	V. 547; VI. 356; IX. 454
Washington	IX. 455
Watertown	IV. 463; VII. 545; VIII. 492; IX. 455; X. 298
Wayland	VI. 356
Webster, III. 325; IV. 463; V. 547; VI. 356; VII. 545; VIII. 492;	
	IX. 455; X. 298
Wellfleet	II. 82; IX. 456
Westborough	II. 81; VII. 545; IX. 456; X. 299
West Boylston	II. 81; VIII. 492
West Brookfield	V. 548; X. 299
Westfield	VII. 545; IX. 456
Westford	VI. 356; VII. 545
Westhampton	II. 83; IX. 457
West Newbury	II. 80; III. 325; V. 548; IX. 457
West Roxbury	II. 81; IV. 463
West Springfield	III. 326; V. 548; VI. 356; VII. 545; IX. 457; X. 299
West Stockbridge	II. 81; IX. 458
Weymouth	II. 82; V. 549; VI. 356; VIII. 492; IX. 458
Whately	IX. 458
Williamsburg	IX. 459
Williamstown	III. 326; V. 549; VIII. 492; IX. 459
Wilmington	IX. 460; X. 299
Winchendon	VI. 356; VIII. 493

Towns, Health of towns — *Continued.*

Winchester	VI. 357; VII. 546; VIII. 493; IX. 460; X. 299
Windsor	VI. 357
Winthrop	II. 81; IX. 460
Woburn	III. 326; IV. 467; VI. 357; VIII. 493; IX. 461
Worcester	II. 82; V. 550; VI. 360; VII. 546; VIII. 494; IX. 461
Wrentham	II. 81; III. 326
Yarmouthport	VIII. 494

Towns, Diseases: —

Catarrh: —

Lynn	VIII. 217
----------------	-----------

Cerebro-spinal fever: —

Abington	V. 277
Amherst	V. 277
Andover	V. 278
Ashland	V. 278
Attleborough	V. 278
Belchertown	V. 278
Beverly	V. 278
Boston	V. 278
Braintree	V. 285
Brighton	V. 285
Brookline	V. 285
Cambridge	V. 286; IX. 361
Charlestown	V. 286
Chelsea	V. 286
Chicopee	V. 287
Dedham	V. 288
Everett	V. 288
Fall River	V. 288
Fitchburg	V. 288
Great Barrington	V. 288
Hadley	V. 288
Haverhill	V. 289
Hingham	V. 289
Holyoke	V. 289
Lancaster	V. 289
Lawrence	V. 289
Leverett	V. 290
Leominster	V. 290
Lowell	V. 290
Lynn	V. 291; VII. 211; VIII. 213
Manchester	V. 292
Marblehead	V. 292
Methuen	V. 292
Milbury	V. 292
Milford	V. 292

Towns, Diseases, Cerebro-spinal fever — *Continued.*

New Bedford	V. 292
North Adams	V. 292
Northampton	V. 292
North Bridgewater	V. 292
Palmer	V. 293
Peabody	V. 293
Quincy Point	V. 293
Roxbury	V. 293
Salem	V. 293
Sandwich	V. 294
Somerville	V. 294
Springfield	V. 294
Stoughton	V. 294
Swampscott	V. 294
Tyngsborough	V. 294
Ware	V. 294
Watertown	V. 294
Webster	V. 294
West Roxbury	V. 295
Weymouth	V. 295
Williamstown	V. 295
Winchendon	V. 295
Winchester	V. 295
Woburn	V. 295
Worcester	V. 295
Charbon:—	
Salem	II. 103
Walpole	II. 99
Cholera infantum:—	
Boston	VII. 503
Consumption:—	
Cambridge	IX. 362
Lynn	VIII. 215
Croup:—	
Cambridge	IX. 360
Lynn	VIII. 212
Diarrhoeal diseases:—	
Cambridge	IX. 359
Lynn	VIII. 210
Diphtheria:—	
Acushnet	VIII. 465
Adams	VIII. 465
Amherst	VIII. 465
Andover	VIII. 465
Arlington	VIII. 466
Ashburnham	VIII. 466

Towns, Diseases, Diphtheria — *Continued.*

Ashby	VIII. 466
Ashland	VIII. 466
Attleborough	VIII. 467
Ayer	VIII. 467; IX. 381
Barnstable	VIII. 468
Becket	VIII. 468
Bellingham	VIII. 468
Berkley	VIII. 468
Beverly	VIII. 469
Boston	VII. 499; VIII. 470
Braintree	VIII. 474
Brimfield	VIII. 474
Brockton	VIII. 474; IX. 396
Brookline	VIII. 474
Buckland	VIII. 474
Cambridge	IX. 360
Conway	VI. 341; VIII. 474
Dennis	VIII. 474
East Bridgewater	VIII. 474
Eastham	VIII. 475
Easthampton	VIII. 475
Easton	VIII. 475
Enfield	VIII. 476
Everett	VIII. 476
Fairhaven	VIII. 476
Fall River	VIII. 476
Fitchburg	VIII. 476
Foxborough	VIII. 478
Framingham	VIII. 478
Gloucester	IX. 407, 463
Granby	VIII. 478
Granville	IX. 408
Halifax	VIII. 478
Hanover	VIII. 478; IX. 411
Hanson	VIII. 479
Harwich	VIII. 479
Haverhill	VIII. 479; IX. 412
Hingham	VIII. 480
Holliston	VIII. 480
Holyoke	VIII. 480; IX. 413
Hudson	VIII. 480
Huntington	VIII. 480
Hyde Park	VIII. 481
Kingston	VIII. 481
Lancaster	VIII. 482
Lawrence	VIII. 482; IX. 416

Towns, Diseases, Diphtheria — *Continued.*

Lee	IX. 418
Leominster	VIII. 483; IX. 419
Lowell	VII. 516; VIII. 451; IX. 421
Lynn	VIII. 212, 437; IX. 423
Malden	VIII. 484; IX. 424
Manchester	VIII. 484
Marblehead	VIII. 484
Marlborough	VIII. 484
Medfield	VIII. 484
Monson	IX. 423
Nantucket	VIII. 485; IX. 429
Natick	VIII. 485
New Bedford	VIII. 485
Newburyport	VIII. 485
North Adams	VI. 347; IX. 47, 432
North Andover	VIII. 485
Northfield	VIII. 486
Oxford	IX. 435
Palmer	IX. 435
Pepperell	VIII. 486; IX. 436
Pittsfield	VIII. 486
Plymouth	IX. 437
Plympton	VIII. 487
Princeton	VIII. 487
Randolph	VIII. 488
Reading	VIII. 488; IX. 438
Rockland	VIII. 488
Rockport	VIII. 488; IX. 441
Russell	IX. 441
Salem	VIII. 445
Salisbury	VIII. 489
Saugus	VIII. 489
Seekonk	IX. 442
Sherborn	VIII. 489
Shrewsbury	VIII. 489
Somerville	VIII. 489
South Adams	IX. 46
Springfield	VIII. 489
Stoneham	VIII. 490
Sturbridge	VIII. 490
Taunton	IX. 492
Upton	VIII. 490
Uxbridge	VIII. 490
Wakefield	IX. 451
Wales	VIII. 490
Waltham	VIII. 491

Towns, Diseases, Diphtheria — *Continued.*

Ware	VIII. 491
Warren	VIII. 491; IX. 454
Watertown	VIII. 492
Webster	VIII. 492
West Boylston	VIII. 492
Weymouth	VIII. 492
Williamstown	VIII. 492; IX. 40, 45
Winchendon	VIII. 492
Winchester	VIII. 493; IX. 460
Woburn	VIII. 493
Worcester	VIII. 494
Yarmouthport	VIII. 494
Dyspepsia:—	
Lynn	VIII. 217
Erysipelas:—	
Cambridge	IX. 361
Lynn	VIII. 214
Fevers, Remittent:—	
Springfield	IV. 462
Hydrophobia:—	
Berlin	IX. 384
Enfield	IX. 402
Influenza:—	
North Prescott	V. 533
Lynn	VIII. 214
Lead-poisoning:—	
Abington	II. 23
Amherst	II. 23
Andover	II. 24
Ashland	II. 23
Athol	II. 23
Attleborough	II. 24
Barre	II. 24
Belmont	II. 30
Blackstone	II. 24
Brimfield	II. 24
Bridgewater	II. 24
Concord	II. 24
Erving	II. 25
Essex	II. 25
Fitchburg	II. 25
Framingham	II. 25
Gloucester	II. 25
Groton	II. 26
Holyoke	II. 26
Hubbardston	II. 26

Towns, Diseases, Lead-poisoning — *Continued.*

Hyde Park	II. 26
Leverett	II. 26
Monson	II. 26
North Adams	II. 27
North Andover	II. 27
Northampton	II. 27
Northborough	II. 28
Pepperell	II. 28
Rutland	II. 28
Shelburne	II. 29
Sherborn	II. 29
Sterling	II. 29
Sudbury	II. 29
Taunton	II. 29
Tewksbury	II. 29
Upton	II. 29
Uxbridge	II. 29
Wakefield	II. 30
Waltham	II. 31
Ware	II. 30
Watertown	II. 30
Webster	II. 31
West Boylston	II. 31
Westminster	II. 31
Wilbraham	II. 31
Worcester	II. 31
Wrentham	II. 31
Malaria:—	
Lynn	VIII. 214
Springfield	IV. 462
Measles:—	
Cambridge	IX. 361
Lynn	VIII. 214
Use of opium:—	
Ayer	III. 170
Barre	III. 170
Belchertown	III. 170
Boston	III. 172
Chilmark	III. 170
Clarksburg	III. 170
Clinton	III. 172
Concord	III. 171
Dedham	III. 171
Eastham	III. 171
Everett	III. 171
Fairhaven	III. 171

Towns, Diseases, Use of opium — *Continued.*

Granby	III. 171
Hadley	III. 171
Hinsdale	III. 171
Leverett	III. 171
Newburyport	III. 171
North Andover	III. 171
Prescott	III. 172
Shrewsbury	III. 171
Stoneham	III. 172
Swampscott	III. 171
Truro	III. 172
Upton	III. 172
Uxbridge	III. 172
Warwick	III. 172
Watertown	III. 172
Westfield	III. 172
Worcester	III. 172
Puerperal fever:—	
Cambridge	IX. 361
Purpura:—	
Lynn	VIII. 215
Rheumatism:—	
Cambridge	IX. 361
Lynn	VIII. 214
Scarlet fever:—	
Boston	VII. 501
Cambridge	IX. 359
Lowell	VI. 345
Lynn	VIII. 212
Small-pox:—	
Athol	III. 301
Ayer	III. 301
Beverly	III. 301
Cambridge	IX. 361
Charlestown	III. 301
Cheshire	III. 301
Chicopee	III. 301
Colrain	III. 301
Essex	III. 301
Holyoke	II. 6
Hopkinton	III. 301
Hudson	III. 301
Leverett	III. 302
Lynn	VIII. 514
Nahant	III. 302
Newton	III. 302

Towns, Diseases, Small-pox — *Continued.*

Pembroke	III. 302
Prescott	III. 302
Reading	III. 302
Rowe	III. 302
Spencer	V. 3, 542
Stoneham	III. 302
Topsfield	III. 302
Worcester	III. 302
Syphilis:—	
Cambridge	IX. 361
Lynn	VIII. 214
Trichina disease:—	
Becket	V. 523
Framingham	IV. 454
Lowell	II. 48
Saxonville	II. 48
Typhoid fever:—	
Amherst	II. 120
Andover	II. 119
Ashburnham	II. 121
Ashland	II. 121; VI. 333
Attleborough	II. 120
Athol	II. 121
Becket	IX. 382
Berkley	II. 122
Beverly	II. 122
Boston	II. 123; VII. 502
Brewster	II. 131
Bridgewater	II. 131
Brighton	VI. 338, 339
Brimfield	II. 130
Brookline	II. 122
Cambridge	II. 131; IX. 361
Chatham	II. 131
Chester	II. 131
Colrain	II. 132
Concord	II. 132
Conway	II. 131
Dartmouth	II. 132
Dennis	II. 132
Dudley	II. 133
Enfield	IX. 403
Erving	II. 133
Essex	II. 133
Fall River	II. 133
Fitchburg	II. 134

Towns, Diseases, Typhoid fever — *Continued.*

Franklin	II. 133
Gloucester	II. 134
Grafton	II. 134
Great Barrington	II. 134
Hadley	II. 134
Hanson	II. 138
Harwich	II. 136
Hingham	II. 137
Holyoke	II. 136; VI. 344
Housatonic Basin	IX. 20, 21
Hudson	II. 137
Huntington	II. 137
Hyde Park	II. 138
Kingston	II. 13
Lawrence	II. 139
Lenox	II. 138
Leominster	II. 138
Leverett	II. 139
Lexington	II. 141
Leyden	II. 142
Littleton	II. 139
Lowell	II. 139
Lynn	VIII. 210
Marshfield	II. 142
Martha's Vineyard	II. 143, 172
Medford	V. 526
Medway	II. 145
Mendon	II. 144
Middleton	II. 145
Montague	II. 145
Nantucket	II. 146
Newburyport	II. 145
New Marlborough	II. 145
Newton	II. 146
Northbridge	II. 146
Orleans	II. 146
Oxford	II. 146
Pembroke	II. 149
Pittsfield	II. 147
Provincetown	II. 148
Randolph	II. 150
Raynham	IX. 485
Reading	II. 152
Rochester	II. 152
Rockport	II. 151
Rowe	IV. 149

Towns, Diseases, Typhoid fever — *Continued.*

Rutland	II. 150
Salem	II. 153
Saugus Centre	IX. 488
Seekonk	VI. 354
Shelburne	II. 153
Shirley	II. 153
Shrewsbury	II. 154
Somerset	II. 153
Somerville	II. 154
Southampton	II. 154
Southbridge	V. 540
South Dennis	VIII. 494
Spencer	II. 154
Springfield	II. 154
Sterling	II. 155
Stockbridge	II. 154
Stoneham	II. 154
Stow	II. 154
Sunderland	II. 155
Sutton	II. 152
Swampscott	II. 155
Taunton	II. 155; IX. 485
Tewksbury	II. 156
Truro	II. 156
Upton	II. 156
Uxbridge	II. 156
Wakefield	VI. 356
Wales	II. 158
Walpole	II. 159
Waltham	II. 159
Ware	II. 156
Warren	II. 157
Warwick	VI. 356
Watertown	II. 158
Webster	II. 156
Westborough	II. 157
West Boylston	II. 157
Westfield	II. 157
Westminster	II. 159
West Newbury	II. 157
West Roxbury	II. 160
West Springfield	VI. 356
Weymouth	V. 549
Wilbraham	II. 160
Williamstown	II. 159; V. 549
Winchester	II. 158

Towns, Diseases, Typhoid fever—*Continued.*

Winthrop	II. 157
Worcester	II. 160
Wrentham	II. 157
Yarmouth	II. 161
Whooping-cough:—	
Cambridge	IX. 361
Lynn	VIII. 213
Towns, Homes of the poor:—	
Boston	IV. 396
Fall River	IV. 401
Lawrence	IV. 405
Lowell	IV. 408
Lynn	IV. 410
Salem	IV. 414
Springfield	IV. 419
Worcester	IV. 423
Towns, Pollution of streams:—	
Ashburnham	VIII. 42
Ayer	VIII. 42
Berkshire County	IX. 9
Bolton	VIII. 43
Boylston	VIII. 43
Canton	IX. 56
Clinton	VIII. 39, 43; IX. 57
Dalton	IX. 57, 59
Dunstable	VIII. 43
Enfield	IX. 63
East Dedham	IX. 63
Fitchburg	VIII. 43; IX. 57, 61, 64
Foxborough	IX. 59, 64
Great Barrington	IX. 12
Groton	VIII. 44
Harvard	VIII. 44
Hinsdale	IX. 9
Holden	IX. 64
Holyoke	IX. 57, 59, 61, 64
Housatonic	IX. 59
Hyde Park	IX. 60, 64
Lancaster	VIII. 44
Lawrence	IX. 60, 61, 62, 64
Lee	IX. 11, 60
Lenox	IX. 11
Leominster	VIII. 44; IX. 57, 64
Lowell	IX. 62, 64
Lunenburg	VIII. 44
Needham	IX. 58

Towns, Pollution of streams — *Continued.*

North Adams . . . . .	. IX. 58, 64
Norwood . . . . .	. IX. 64
Pepperell . . . . .	. VIII. 44
Pittsfield . . . . .	. IX. 10, 60, 65
Princeton . . . . .	. VIII. 44
Readville . . . . .	. IX. 58
Richmond . . . . .	. IX. 10
Shirley . . . . .	. VIII. 44; IX. 58, 65
South Adams . . . . .	. IX. 65
South Walpole . . . . .	. IX. 65
Stockbridge . . . . .	. IX. 12
Stoughton . . . . .	. IX. 60, 62
Sterling . . . . .	. VIII. 45
Taunton . . . . .	. IX. 65
Townsend . . . . .	. VIII. 45
Walpole . . . . .	. IX. 58, 60, 61, 65
Ware . . . . .	. IX. 65
Warren . . . . .	. IX. 65
West Boylston . . . . .	. VIII. 46
Westminster . . . . .	. VIII. 46
Wilbraham . . . . .	. IX. 65
Williamstown . . . . .	. IX. 66
Windsor . . . . .	. IX. 10

Transportation: —

Transportation of live-stock . . . . .	. VI. 18, 77
Act of Congress to prevent cruelty to animals . . . . .	. VI. 88
Bedding in stock-cars . . . . .	. VI. 97
Transportation of swine . . . . .	. VI. 107
Sheep . . . . .	. VI. 109
Horses . . . . .	. VI. 109
Capacity of cattle-cars . . . . .	. VI. 98, 99
Space per animal . . . . .	. VI. 100
Requirements of good cars . . . . .	. VI. 96

Traps: —

Traps for drains VII. 429
----------------------------	------------

Trichina disease: —

Trichina disease in Massachusetts . . . . .	. II. 8, 45
Signs of trichina disease . . . . .	. II. 47
Trichina disease in Lowell and Saxonville . . . . .	. II. 48
Prevention of trichina disease . . . . .	. II. 50
Trichina disease in Framingham . . . . .	. IV. 454
Trichina disease in Becket . . . . .	. V. 523
Trichina spiralis . . . . .	. VI. 151
Epidemics in United States and Europe . . . . .	. VI. 153
First discovery of trichina . . . . .	. VI. 152
Frequency in swine . . . . .	. VI. 153

Trichina disease — *Continued.*

Introduction and progress in man	VI. 151
Pork as the source in man	VI. 151
Symptoms of trichina in pigs	VI. 154

Tuke, Batty:—

Care of the insane	VIII. 362
------------------------------	-----------

Typhoid fever:—

Prevention of typhoid fever	I. 44
Typhoid fever in Massachusetts	II. 9
Cause of typhoid fever in Massachusetts	II. 109
Table of deaths of persons above five years of age from typhoid fever in Massachusetts during the years 1859-68	II. 114
Table showing relative mortality for the ten years, from typhoid fever in persons above five years of age, in the larger and smaller cities and towns	II. 118
Table of deaths from typhoid and typhus fever in Boston, 1846-67,	II. 125
Table of deaths from typhoid fever in Boston compared with a fixed number of the living in each year	II. 126
Shaker communities	II. 161
Dr. James Jackson on typhoid fever	II. 174
Dr. Pettenkofer on typhoid fever	II. 112, 175
Typhoid fever a disease of the country rather than the town	II. 118
Typhoid fever among the Shakers	II. 161
Dr. Nathan Smith on typhoid fever	II. 163
Dr. Rush on typhoid fever	II. 171, 179
Typhoid fever in Martha's Vineyard	II. 143, 172
Prevention	II. 178
Typhoid fever and intermittents	II. 174
Typhoid fever and decomposition	II. 178
Typhoid fever in houses newly built	III. 323
Typhoid fever in vicinity of Pittsfield	IV. 459
Southbridge	V. 540
Typhoid investigation in Medford	V. 526
Typhoid fever in Weymouth	V. 549
Williamstown	V. 549
Massachusetts	VII. 413

Upham, J. B.:—

Report on the epidemic of cerebro-spinal meningitis in Massachusetts in 1873	V. 24, 261
Circular	V. 270
Tabular statement of cases	V. 272
Deaths from cerebro-spinal meningitis in Boston	V. 279

Uxbridge:—

Water-supply, sewerage, etc.	VII. 86
--------------------------------------	---------

Vaccination:—

Vaccination in Ireland	II. 7
----------------------------------	-------

Vaccination — *Continued.*

Circular on vaccination	III. 299
Law concerning vaccination	III. 303; IV. 3
Vaccination	V. 479

Vanilla:—

Spontaneous change in the extract or essence of vanilla . . .	IV. 172
---	---------

Vegetable parasites:—

Vegetable parasites, the diseases caused by their growth upon man, III. 9, 247
--

Ventilation:—

Architects should study ventilation	I. 52
Prevention of disease by ventilation	I. 51
Ventilation of schoolhouses	II. 14, 369; V. 434; IX. 231
Ventilation by open fires	I. 48
Air and some of its impurities	II. 15, 395
Outer air in Boston	II. 399
Rooms of the Institute of Technology	II. 400
Air of schoolrooms in Boston	II. 400
Outer air in Cambridge	II. 404
Air of a recitation room, Harvard College	II. 404
Microscopic examination of dust	II. 405
Ventilation explained	II. 370
Amount of air needed for ventilation	II. 373
Theory of efficient ventilation	II. 376
Explanation of plans for ventilation	II. 381
Ventilation of workshops	III. 316
Ventilation of house-drains	IV. 26, 461
Ventilation at Massachusetts State Prison	VI. 376
Ventilation of hospitals	V. 331
Ventilation of railroad-cars	VI. 20, 225
Gen. Morin on heating and ventilation	II. 379; VI. 237
Experiments by W. R. Nichols	VI. 229
Ventilation of sewers	VIII. 163
Methods of heating and ventilating cars	VI. 238
Contribution to the study of ventilation	X. xliii, 229
Record of observations on heating and ventilation	X. 234
Examination of air for carbonic acid	X. 241
Dr. G. W. Gay on results of treatment at the City Hospital . . .	X. 247

Vinegar:—

The adulteration and impurities of vinegar	III. 134
--	----------

Wakefield:—

Board of Health regulations	IV. 464
Water-supply, drainage, etc.	VII. 221
Covered stream used as a sewer in Wakefield	VII. 221

Walling, H. F.:—

"Great ponds" of Massachusetts	IV. 117
--	---------

Walpole:—

Sewage clarification	VIII. 65
--------------------------------	----------

Waltham:—

Examination of filtering-scheme at Waltham	V. 144
Water-supply, sewerage, etc.	VII. 103
Filter-gallery at Waltham	IX. 191
Examination of water from Waltham	IX. 193
Observations on water-levels, Waltham Water-works . . .	IX. 196, 197
Observations on temperature, Waltham	IX. 199

Ward, C. D.:—

Neponset River	VII. 89
Chicopee River	VII. 109

Ward, L. B.:—

Statement regarding woollen manufacture	VII. 37
---	---------

Water:—

Quality of water	I. 55
Mystic-pond water	II. 15
Poisoning by lead pipe used for the conveyance of drinking- water	II. 8, 21
Action of Cochituate water on lead pipe	II. 32
Literature of the subject	II. 38
Examination of the water of Mystic Pond and of its sources of supply	II. 385
Water of various cities compared	II. 393
Report of W. R. Nichols	II. 387
Milldams and water obstructions	III. 6, 59
Water-supply of towns	IV. 10, 19, 99; V. 23, 61
Lakes and "great ponds"	IV. 102
Great ponds public property	IV. 105
Cochituate water	IV. 106
Pollution of streams, the water-supply of towns . . .	IV. 10, 19, 99
What makes the water bad?	IV. 187
London water	IV. 100
Excessive use of water	IV. 272
Water in lead pipes at Rockport	IV. 460
Springfield	IV. 461
Water of wells in Eastern Massachusetts	IV. 101
Water-supply of towns	V. 23
Use of zincked or galvanized iron for the storage or conveyance of drinking-water	V. 26, 487
Merrimac River	V. 64
Examination of Merrimac River	V. 70
Blackstone River	V. 82; VII. 73
Examination of Blackstone River	V. 83
Charles River	V. 90; VII. 97
Examination of Charles River	V. 92
Charles River as a source of water-supply	V. 142
Examination of Sudbury and Concord Rivers	V. 98
Neponset River	V. 102; VII. 89

Water — *Continued.*

On rivers as a source of water-supply	V. 103
Present condition of water-supply of certain cities in Massachusetts	V. 111
Cochituate Lake and its sources of supply	V. 111, 116
Mystic water	V. 127
Examination of Mystic Lake	V. 130
The Merrimac River as a source of water-supply	V. 132
Examination of filtering-scheme at Lowell	V. 135
Lawrence Water-works	V. 140
Examination of filtering-scheme at Waltham	V. 144
Methods of analysis	V. 148
J. M. Merrick's examination of Charles-river water	V. 152
Drinking-water among the farmers	V. 238
Mallet on cast iron in simple contact with zinc immersed in fresh water	V. 492
W. R. Nichols, action of water upon zincked pipes	V. 495
Hydrographical survey	VI. 6
Fleck's examination of well-water from Dresden cemeteries	VI. 281
Examination of well-water from vicinity of cemeteries,	VI. 295, 297, 298
Act to provide for an investigation of the question of the use of running streams as common sewers in relation to public health	VII. 8, 23
Special report under the Act	VII. 8
Intestinal disorder due to contamination of water by impure ice,	VII. 14
The pollution of rivers, with general observations on water-supplies	VII. 8, 21
Prevention of pollution	VII. 147
Statistics of the river-valleys	VII. 37
Limits of poisoned water	VII. 69
Chicopee River	VII. 109
Taunton River	VII. 123
Cities and towns of Massachusetts supplied with water by aqueduct	VII. 194
Dangers to wells from cesspools	VII. 190
Drinking-water should not be drawn from tanks	VII. 441
Experiments upon fish with poisoned water	VII. 69
Results of experiments restated	VII. 72
Gathering-grounds for water-supply	VII. 201
Water-supply, sewerage, etc.	VII. 104
Water-supply, drainage, and sewerage of the State from a sanitary point of view	VII. 175
Methods of analysis of water	VII. 174
Water-supply	VII. 191
And sewerage	VII. 193
Statistics of cities and towns supplied by aqueducts	VII. 194
Pollution of wells and other sources of water-supply	VII. 208; XI. 34

Water — *Continued.*

Water-courses or ponds	VII. 211
Sewage of one town polluting air or water of another	VII. 223
Water-supply and sewerage of Boston	VII. 232, 236
Chicopee	VII. 246
Examination of water from Lynn	VII. 254
Water-supply and sewerage of Worcester	VII. 264
Analysis of various waters	VII. 266
Examination of various well-waters	VII. 268
New water-supply of Springfield	VII. 271
Springfield or Ludlow Reservoir	VII. 271
Examination of water from Ludlow Reservoir	VII. 273
Examination of water from Pittsfield	VII. 275
Water contaminated by sewage	VII. 283
Analysis of water of Nashua River	VIII. 42, 52, 56
Purification of polluted streams	VIII. 59
Pollution of the Nashua	VIII. 61
Some pollution unavoidable	VIII. 62
Testimony of Robert Rawlinson	VIII. 62
Disposal of sewage in the Nashua Basin	VIII. 64
Propriety of legislation	VIII. 65
The Nashua River beyond the State line	VIII. 67
Pollution of the Merrimac River	VIII. 68
The Merrimac and other waters	VIII. 70
Effect of farming, percolation, etc.	VIII. 71
Legislation in England	VIII. 73
An Act for making further provision for the prevention of pollution of rivers in England	VIII. 73
Contaminated water	VIII. 114
Opinion of Alfred Carpenter	VIII. 114
Polluted water	VIII. 122
Lynn, fresh waters	VIII. 172
Water-supply	VIII. 184
Wells	VIII. 184
Water-supply and sewerage in the Hoosac and Housatonic Basins	IX. 8
Analysis of water from Pittsfield and Lee	IX. 25
Examination of water from Hoosac River	IX. 36
Well-water in Williamstown	IX. 44
Water from North Adams	IX. 51
The filtration of potable water	IX. xxiv, 137
Hard water softened by Clark's process	IX. 140
Artificial filtration on the large scale	IX. 141
Description of American filter-beds	IX. 146
Filtering-works	IX. 149
Hudson, N.Y.	IX. 149
Columbus, O.	IX. 151

Water — *Continued.*

Toledo, O.	IX. 151
Other American localities	IX. 151
Object and results of filtration on the large scale	IX. 153
Observations on the water of the various London companies	IX. 162
Examination of water from Poughkeepsie, N.Y.	IX. 164
Hudson, N.Y.	IX. 167
Experiments at Springfield	IX. 168
Examination of water from Springfield	IX. 171
Natural filtration	IX. 175
Circular	IX. 177
C. O. Chapin on filtering-gallery on the Westfield River	IX. 180
Character and proximate source of the water	IX. 182
Lowell	IX. 191
Waltham	IX. 191
Examination of the water from Waltham	IX. 193
Observations on water-levels at Waltham Water-works	IX. 196
Temperature, Waltham	IX. 199
Taunton	IX. 200
Examination of water from Taunton	IX. 202
Household filtration	IX. 205
Filter of animal charcoal	IX. 211
Spongy iron filter	IX. 214
Cistern-water filtered through brick walls	IX. 219
Note with reference to the methods of analysis	IX. 222
Bibliography	IX. 224
Water-supply of Cambridge	IX. 336
Pollution of streams	X. xxiii
Act relating to pollution of streams	X. xxiii
Water-supplies	X. 252
Water-supplies in Massachusetts	X. 254
Analysis of water in Cambridge	X. 119, 120
Impure water a cause of disease	X. 152, 208, 209
Difficulty of detecting impurity	X. 152
Self-purification	X. 177, 217
Filtration	X. 181
Impurities of water	X. 153
Ground water	X. 125, 133, 134, 160, 181, 201, 212, 221

Water-closets:—

Water-carriage system.	IV. 25
Substitutes for the water-carriage system	VII. 299
Ancient origin of water-closets	VII. 446
Direct supply of water	VII. 454
Disinfecting style	VII. 448
General ignorance as to mechanism of water-closets	VII. 445
Hopper-closet	VII. 454
Jennings closet	VII. 450

Water-closets — *Continued.*

London regulations for indirect supply of water	VII. 455
Ordinary style very defective	VII. 446
Pan-closet	VII. 447
Ventilation	VII. 448
Water-closets in schools	IX. 234

Waterlow:—

Waterlow Buildings in London	II. 204
--	---------

Waterman, Thomas:—

Consumption among the Jews	IV. 380
--------------------------------------	---------

Watertown:—

Union Stock-yards, Watertown	VI. 130
Water-supply, sewerage, etc.	VII. 103

Weather:—

Sensitiveness of public health to weather variations	VII. 491
--	----------

Wellington Brook:—

Wellington Brook	IX. 340
----------------------------	---------

Wells:—

Wells	I. 53
Wells near graves in Massachusetts	VI. 295, 297, 298
in Dresden	VI. 281
Wells in Massachusetts	VI. 292
Well-water in Dresden	VI. 283
Well-water from thirteen towns in Massachusetts	VI. 301
Contamination of well-waters	VII. 208, 431; X. 252; XI. 34
List of towns where the drinking-water is polluted	VII. 209
Analysis of various well-waters	VII. 269
Contaminated wells in Lynn	VIII. 186
Examination of well-water from vicinity of cemeteries, VI. 281,	
	292, 295, 297, 298

Westfield River:—

Filtering-gallery on the Westfield River	IX. 180
--	---------

White, J. C.:—

Communication to board of aldermen of consulting-physicians of Boston	II. 56
Vegetable parasites and the diseases caused by their growth upon man	III. 9, 247
Nature of vegetable parasites	III. 249
Diseases to which they give rise upon man	III. 253
Pseudo-parasites	III. 276
Their growth upon the domestic animals	III. 277
Their supposed identity, and their relations to common moulds,	III. 278
Common sources of contagion, and precautions to be used against them	III. 287
Ringworm	III. 258
Pityriasis versicolor	III. 268
Alopecia areata	III. 270

White, J. C.:—*Continued.*

Myringomycosis III. 274

Whitehead, James:—

Examination of arsenic-bearing dust III. 40

Wigglesworth, E.:—

Intoxicating drinks III. 121, 125

Wilkes, James:—

Fatal accidents in insane asylums VIII. 392

Willard Insane Asylum:—

Willard Insane Asylum described VIII. 353

Williamstown:—

Description of Williamstown IX. 40

Examination of well-water IX. 43

Winchendon:—

Sore throat VI. 357

Winchester:—

Leather manufactories of Winchester VII. 244

Water-supply VII. 262

Winsor, Frederick:—

School hygiene V. 25, 391

Circular V. 395

The sexes in school V. 397

Influence of puberty V. 397

Osseous, respiratory, digestive, and nervous system V. 400

Chairs V. 402

Eyesight V. 404

Study out of school V. 407

School sessions V. 410

Article by A. C. Perkins V. 411

Work and "worry" V. 412

School-going compared with other occupations V. 416

Half-time system V. 418

Evidence from P. P. Carpenter V. 421

Letter from G. H. Dunbar V. 423

Letter from Gen. H. K. Oliver V. 425

Modification of schools V. 428

Defective ventilation V. 434

Privies V. 438

Vacations V. 439

Number of pupils V. 441

Women on school committees V. 441

Properly constructed schoolhouses V. 442

Physical exercises V. 443

Location of buildings V. 445

Sanitary inspection V. 446

The water-supply, drainage, and sewerage of the State from the

sanitary point of view VII. 175

Winsor, Frederick — *Continued.*

Introduction	VII. 175
Circular	VII. 176
List of towns furnishing replies	VII. 177
Excrement removal	VII. 180
Methods employed in Great Britain	VII. 181
Method employed at the Maryland Hospital for the Insane	VII. 186
Water-supply	VII. 191
Water-supply and sewerage	VII. 193
Statistics of cities and towns supplied by aqueducts	VII. 194
Outlets of sewers	VII. 202
Lists of cities and towns showing disposition of sewage	VII. 202
Is such sewage offensive?	VII. 205
Pollution of wells or other sources of water-supply	VII. 208
Water-courses or ponds	VII. 211
Covered stream used as a sewer in Wakefield	VII. 221
Proctor's Brook in Peabody	VII. 224
Sewer in Chicopee	VII. 226
Damp and wet cellars	VII. 227
Sewage of one town polluting air or water of another	VII. 228
Reports from various localities	VII. 231
Water-supply and sewerage of Boston	VII. 232
Examination of the water-supplies of Boston	VII. 236
Statistics of leather manufactories of Woburn and Winchester for 1875	VII. 244
Examination of water from Mystic Lower Pond	VII. 246
Water-supply and sewerage of Chicopee	VII. 246
Sewerage of Fall River	VII. 247
Haverhill	VII. 248
Lynn	VII. 249
Examination of water from Lynn	VII. 254
Sewerage of Salem	VII. 257
Examination of water from Salem	VII. 260
Little Pond, South Braintree	VII. 261
Water-supply and sewerage of Worcester	VII. 264
Extracts from report of C. H. M. Blake	VII. 265
Analysis of various waters	VII. 266
Examination of various well-waters	VII. 268
New water-supply of Springfield	VII. 271
W. R. Nichols on the Springfield or Ludlow Reservoir	VII. 271
Examination of water from Ludlow Reservoir	VII. 273
Pittsfield	VII. 275
Pittsfield ice-supply	VII. 274
Coal-gas from heating-apparatus	X. xlii, 73
Woburn:—	
Defective drainage	VI. 357
Leather manufactories	VII. 244

Woolen manufacture:—

Pollution of water by woollen manufactories . . .	VII. 40; VIII. 35
Statement regarding woollen manufacture . . .	VII. 37
Estimates of the waste stuff from the manufacture into cloth of thirty tons of wool . . .	VII. 39

Women:—

Women on school committees . . .	V. 441
Inebriate asylums for women . . .	VI. 43

Worcester:—

Sewage of Worcester . . .	IV. 74, 77, 109
Homes of the poor . . .	IV. 423
Water-supply and sewerage of Worcester . . .	VII. 87, 264
Extracts from report of C. H. M. Blake . . .	VII. 265
Sewage of Worcester Lunatic Asylum . . .	X. xx

Yellow fever:—

Yellow fever and filth . . .	VIII. 127
Yellow fever epidemic . . .	X. xxix

Yellowlees:—

Care of the insane . . .	VIII. 387
--------------------------	-----------

Zinc:—

Use of zincked or galvanized iron for the storage or conveyance of drinking-water . . .	V. 26, 487
Mallet on cast iron in simple contact with zinc immersed in fresh water . . .	V. 492
Action of water upon zincked pipe . . .	V. 491, 495

ACME
BOOKBINDING CO., INC.

MAY 6 1991

100 CAMBRIDGE STREET
CHARLESTOWN, MASS

